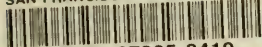


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CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

ANNUAL REPORT
FISCAL YEAR 1962-63

WATER SUPPLY, POWER AND UTILITIES
ENGINEERING BUREAU
AND
BUREAU OF LIGHT, HEAT AND POWER

CITY AND COUNTY OF SAN FRANCISCO

PUBLIC UTILITIES COMMISSION

A N N U A L R E P O R T

FISCAL YEAR 1962-63

HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES

ENGINEERING BUREAU

AND

BUREAU OF LIGHT, HEAT AND POWER

O. L. MOORE
GENERAL MANAGER

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CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

HETCH HETCHY WATER SUPPLY
POWER AND UTILITIES ENGINEERING BUREAU
425 MASON STREET
SAN FRANCISCO 1

PHONE PROSPECT 5-7000

August 28, 1963

Subject: ANNUAL REPORT
FISCAL YEAR 1962-63



Mr. Robert C. Kirkwood
Manager of Utilities
Public Utilities Commission
City and County of San Francisco

Dear Mr. Kirkwood:

The Annual Report for fiscal year ending June 30, 1963, of Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau is respectfully submitted.

Approximately \$29 million in funds appropriated this fiscal year were administered for Department activities covering operations, maintenance, engineering, and construction. This amount does not include previously appropriated funds for construction under way or completed during the year.

Hetch Hetchy Project revenues from sale of water and power were \$14,048,019 compared to total expenditures of \$12,313,741, including bond interest and redemption. Revenue in excess of expenditures was \$1,734,278 compared to budget estimate of \$373,006, thus reflecting a very satisfactory operating year. Reasons for the increase were:

1. Above-normal precipitation and runoff on the watershed reduced the necessary amount of purchased power and permitted serving a new power customer, Hercules Powder Company.
2. Taxes paid to Tuolumne County were considerably less than the amount budgeted as a result of negotiated reduction in assessed valuation of City's water rights.
3. Delay in starting construction of New Don Pedro Dam deferred bond sales which reduced contemplated bond service costs.

Engineering and construction for Hetch Hetchy Project, San Francisco International Airport, and Municipal Railway continued at a high rate. During the year, \$16 million in construction contracts were awarded. At year's end, plans and specifications for an additional \$4 million of work were being prepared. Total value of performed construction work was \$16,250,000 with \$9 million under current contracts remaining to be done.

On the Hetch Hetchy Project, the \$11 million Canyon Power Tunnel, a major element of the Canyon Power Development, was more than half completed. Construction of the third aqueduct pipeline across the San Joaquin Valley was started, with eleven of the 47 miles of 78-inch diameter line completed and a contract for an additional 21.5 miles awarded.

At San Francisco International Airport, improvements to meet the increasing demands of jet-age traffic continued at a rapid pace. The major development was construction of the \$11 million South Terminal building and associated piers, scheduled to open in September, 1963. Runway 28R was being extended; upon completion, three of the Airport's four runways will have a paved length of at least 9,500 feet. At the end of the year, construction of the first stage of the four-level parking garage was about to start. The initial structure, scheduled for completion in 1965 at an estimated cost of \$9.5 million, will accommodate 2,850 automobiles.

Municipal Railway facilities including track, overhead trolley wires and feeders, were modified to accommodate the State in the construction of the Southern Freeway. Preliminary studies have been made of the Bay Area Rapid Transit District's proposed system and the necessary coordination with present transit facilities.

During the year, \$956,265 was expended for the operation, maintenance, and repair of the street lighting system. As of June 30, 1963, there were 29,355 street lights in service, an increase of 221 for the year.

In closing, we wish to express our grateful appreciation to all Department employees, without whose industry and loyalty none of the accomplishments listed herein would have been possible.

Very truly yours,

A handwritten signature in dark ink, appearing to read "O. L. Moore", with a long, sweeping horizontal line extending to the right.

O. L. MOORE
General Manager

ANNUAL REPORT

I. ORGANIZATION AND RESPONSIBILITIES

HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU AND BUREAU OF LIGHT, HEAT AND POWER, as a single unit under its General Manager, serves San Francisco in the dual function of an operating department and a service bureau. Its policies are established by the Public Utilities Commission of the City and County of San Francisco and administered by that agency's Manager of Utilities.

Hetch Hetchy Water Supply and Power System, an operating unit, commonly known as Hetch Hetchy, encompasses a municipally owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River in California's Sierra Nevada and delivers to the San Francisco Water Department. Most of the water supplied in San Francisco and the Water Department service area comes from this source. Hetch Hetchy also operates and maintains hydroelectric generating stations and high voltage transmission lines to produce and distribute electric energy as a by-product of its major function.

The Utilities Engineering Bureau provides engineering services for Hetch Hetchy, San Francisco International Airport, and San Francisco Municipal Railway and is thus responsible for the design and construction of all improvements for these utilities.

The Bureau of Light, Heat and Power is primarily a service bureau. It arranges, under contracts, for the furnishing of electric, gas, and steam services to municipal departments and supervises monthly billing under these contracts. It also has charge of planning and improvement of street lighting furnished by the Pacific Gas and Electric Company and supervises contracts for street lighting operation and maintenance. The financing, design, and construction of City-owned street lighting improvements are under jurisdiction of the Department of Public Works. Plans for these improvements are subject to approval by the Public Utilities Commission through this Bureau.

For the fiscal year 1962-63, budgeted funds administered by this Department for operations, maintenance, engineering, and construction were as follows:

<u>Budget</u>	<u>No. of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Project	116	\$13,999,094
Utilities Engineering Bureau	161	1,678,679
Bureau of Light, Heat and Power	12	4,494,572
1955 Hetch Hetchy Power Bond Fund	--	519,619*
1956 Airport Bond Fund	--	495,955*
1961 Municipal Water System Bond Fund	--	9,501,841*
		\$30,689,760
Less duplications due to budget transfers		1,504,352
TOTAL	289	\$29,185,408

*Does not include funds previously appropriated for construction under way or completed during fiscal year 1962-63.

II. HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

Description

Hetch Hetchy is primarily a water supply project utilizing the precipitation and runoff of the upper Tuolumne River watershed, on the westerly slope of the Sierra Nevada, some 150 miles east of San Francisco Bay. This supply supplements local sources in San Mateo and southern Alameda counties for domestic and industrial use within the City and County of San Francisco and its suburban area.

Electric energy generated from the falling water is conveyed to San Francisco over transmission lines of the City and Pacific Gas and Electric Company under a wheeling agreement. This power source supplies municipal needs including water supply pumping stations, municipal airport, street transit system, street lighting, public building lighting, and miscellaneous other loads. Also, electric energy is supplied to two irrigation districts in the San Joaquin Valley to supplement generation of their own plants and, through facilities of the Pacific Gas and Electric Company, to four industrial customers, two located in Santa Clara County, and two in Contra Costa County. Load requirements in excess of the City's Hetch Hetchy generation are supplied by supplemental power and energy purchased from the Pacific Gas and Electric Company.

Hetch Hetchy Project is self-supported by revenues from electric power sales and wholesale delivery of water to the San Francisco Water Department. In turn, the Water Department transmits and distributes the water for sale to customers.

The operating properties of Hetch Hetchy water supply and power system are located in Tuolumne, Stanislaus, San Joaquin, and Alameda Counties. The water supply facilities include: eight dams with appurtenant impounding and regulating reservoirs and diversion works, sixty-seven miles of tunnels, and ninety-five miles of aqueduct pipelines. The power system facilities include: three powerhouses, Moccasin-80,000 kva, Cherry-150,000 kva, and Intake-3,800 kva (standby), 190 miles of high voltage transmission lines, substations and switchyards. The facilities also include electric distribution, telephone and radio communication systems for project use.

The power system is being expanded by construction of the second stage of the Canyon-Cherry Power Development financed from the 1955 Hetch Hetchy Power Bonds in the amount of \$54 million. The first stage, completed and placed in service in August, 1960, included Cherry Power Tunnel and Powerhouse, Intake Switchyard, Warnerville Substation, and the associated transmission system. The second stage, presently under construction, includes Canyon Power Tunnel and Powerhouse (75,000 kva generating capacity) and appurtenant facilities. This will complete the power system expansion program authorized under the 1955 bond issue.

A map showing the Hetch Hetchy water supply and power system, together with San Francisco's Water Department properties and facilities, is included in the Appendix.

Revenue and Expenditures

Revenue from Hetch Hetchy Project operation is derived principally from two sources:

1. Wholesale delivery of water to the San Francisco Water Department.
2. Sale of electric power and energy to San Francisco municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and four industrial customers - Permanente Cement Company and Kaiser Aluminum & Chemical Corporation's aluminum foil plant, in Santa Clara County, and Dow Chemical Company and Hercules Powder Company, in Contra Costa County.

Fiscal year 1962-63 revenue from sale of water and for standby service to the San Francisco Water Department was \$5,000,000. Gross sales of electric energy amounted to \$8,930,781, compared to \$8,572,792 during the previous year, an increase of 4.2 percent. Gross revenue from sale of electric energy to City departments and Modesto and Turlock Irrigation Districts was less than in 1961-62. The revenue decrease from City departments was due to reappraisal of Hetch Hetchy power production costs. This resulted in application of a larger billing discount for municipal uses compared to the previous year. Also, for the first time, the billing discount was made effective for street lighting service. The decrease from the irrigation districts reflected improved water conditions at their reservoirs resulting in less power purchase from the City.

Increase in gross revenue from sale of electric energy was derived from the two chemical customers, Dow Chemical Company and Hercules Powder Company, and other electric sales. The two-fold increase from Dow Chemical resulted from a year's purchase compared to six months for last year. Hercules Powder became a new customer of the City on May 1, 1963. Increase from other sales was due principally to delivery of electric energy to project contractor for construction of the Canyon Power Tunnel. Additional revenue of \$117,238 was received from service orders, rentals, meals, sale of surplus property, and other items.

During the year, \$226,974 was expended for purchase of electric energy for resale, compared to \$2,663,144 the previous year. The large reduction resulted from the above-normal water conditions existing at all of the City's mountain reservoirs, which allowed maximum utilization of available water. Bond interest and redemption costs on outstanding Hetch Hetchy bonds amounted to \$8,145,052 for the year.

Tables 1, 2 and 6 show comparative data on receipts, expenditures, and sales of water and power in the operation of the Hetch Hetchy water supply and power system.

Taxes

In the matter of taxation of the City's water rights by Tuolumne County, the Fifth District Appellate Court rendered an opinion on August 1, 1962. This upheld the opinion of the lower court that the water filings made by the City were tax-exempt but those acquired by the City by purchase were taxable. This case pertained to the 1960-61 taxes which had been paid under protest by the City.

The 1961-62 taxes had also been paid under protest pending the decision in the above case. Based on the findings of the court and by agreement between the City and Tuolumne County, \$722,950.04 including \$26,363.88 interest, was refunded to the City.

For fiscal year 1962-63, the Tuolumne County Assessor placed an assessed valuation of \$15,449,300 on the City's water rights in that county based on four points of diversion. After negotiations, Tuolumne County, by resolution dated August 3, 1962, reduced the assessed valuation of the City's water rights to \$3,000,000.

Taxes for the 1962-63 fiscal year on utility properties under the jurisdiction of the Hetch Hetchy Project, located outside the City and County of San Francisco, were paid in the following amounts:

<u>Tax-Levying Body</u>	<u>Assessed Value</u>	<u>Taxes Paid</u>
Alameda County	\$ 1,600	\$ 125.80
San Joaquin County	25,825	1,659.20
San Mateo County	1,515	120.04
Stanislaus County	52,530	4,144.27
Tuolumne County	3,231,430 (a)	183,696.18
Banta-Carbona Irrigation District	3,192	137.26
Modesto Irrigation District	13,600	0 (b)
Oakdale Irrigation District	12,320	862.40
West Stanislaus Irrigation District	1,800	99.00
City of Redwood City	2,980	54.04
TOTAL		<u>\$190,898.19</u>

(a) Includes \$3,000,000 assessment for water rights.

(b) Tax rate for fiscal year 1962-63 set at \$0.00.

Water Production and Transmission

After a three-year dry cycle from 1959 through 1961 and a normal year in 1961-62, it appeared as if 1962-63 would be another dry year. There was no precipitation in the Tuolumne watershed during the 41 days from December 19, 1962 to January 29, 1963, which was extremely unusual for that period. However, for the following 5 days, heavy, warm rains fell up to the 8,000-foot level, resulting in high stream flow and the early melt and runoff of the existing snow pack. The watershed received below-average rainfall during April, 1963, which amounted to 0.13 inches as compared to a normal for the month of 3.32 inches. Fortunately, late snows in May and early June, developed sufficient runoff to classify 1962-63 as an above normal water year.

Due to considerable runoff, Hetch Hetchy, Lake Eleanor and Lake Lloyd, with respective storage capacities of 360,400 acre-feet, 27,100 acre-feet and 268,200 acre-feet, were filled. As of June 30, 1963, impounded water will enable the City to maintain full power production at its Moccasin and Cherry Powerhouses during the coming fall and winter.

On May 8, 1963, water above normal draft was released from Hetch Hetchy Reservoir to meet flood control requirements under agreement with the Corps of Engineers. This is the first time since 1958 that releases for flood control have been necessary.

During the year, 45,738,100,000 gallons of water were diverted by the City from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department. In addition, 132,150,000 gallons were delivered at Mocho Shaft of the Coast Range Tunnel to the United States Atomic Energy Commission for use at the Lawrence Radiation Laboratory at Livermore.

For the first time, the Department used helicopters to transport personnel to higher elevations for snow surveys.

Table 3 shows comparative data on precipitation, runoff, storage, and deliveries of the Hetch Hetchy water supply system.

Power System Operation

As a result of favorable runoff during the spring of 1962, power operation for fiscal year 1962-63 began with storage in Lake Lloyd at 93 percent of capacity and Hetch Hetchy Reservoir full and spilling. Electric power generation was scheduled to meet load requirements as closely as possible. Moccasin Powerhouse was operated at full production and Cherry Powerhouse scheduled to utilize water estimated to be available. Under this program, storage in Lake Lloyd rose to maximum capacity at the end of the 1963 spring runoff.

A three-day storm in late January, caused overtopping of Lake Eleanor Dam and a resultant heavy flood flow down Cherry River. On the morning of February 1, the tailrace of Cherry Powerhouse was flooded due to water rising two feet above the turbine nozzle centerline. Although it was necessary to shut down for eleven hours, the plant was not damaged. Moccasin Powerhouse operated without interruption during the storm.

As a result of the April, 1963 snow survey, estimates of runoff indicated more energy would be available than had been anticipated. Consequently, assignment to the City of the electric service contract between Pacific Gas and Electric Company and Hercules Powder Company was made effective May 1, 1963. This permitted increased generation at Cherry Powerhouse, thus utilizing water for energy production which would otherwise have been lost. Gross revenue from the new customer for May and June was \$136,775, after deducting charges paid to Pacific Gas and Electric Company for transporting the City's power over Company's transmission system.

In April, 1963, the Canyon Power Tunnel contractor began clearing the channel of Tuolumne River below O'Shaughnessy Dam. This required shutting off the discharge at the dam for about 11 hours each day which, in turn, decreased water flow to Moccasin Powerhouse. The resultant decrease in energy generation at Moccasin was offset by a corresponding increase at Cherry, substantially meeting the energy requirements for the month.

Tables 4 to 7, inclusive, show comparative operating statistics for the Hetch Hetchy power system.

Improvements to Operating Properties

During the year, three stream gaging stations were constructed; one each on San Joaquin River at Laird Slough, Tuolumne River below Early Intake, and Cherry River below Cherry Powerhouse. An interesting feature of this work on the latter two stations was the use of helicopters to transport concrete for the cable anchors to the relatively inaccessible sites.

Modification and major maintenance work at Cherry Powerhouse included: installation of turbine automatic lubricating system, replacement of water wheel on turbine unit No. 1 for reconditioning, and replacement of needle tips and nozzle seats on turbine unit No. 2. Also, loose generator slot-wedges on both units were repaired by Allis-Chalmers Company at no cost to the City.

Alterations to Warnerville Substation and transmission lines No. 7 and 8 were completed. This work included modification of metering facilities at Warnerville Substation, line sectionalizing switches at Oakdale Substation, and installation of line grounding switches at Modesto Substation J. Insulating oil in the power transformers and oil circuit breakers at Moccasin Switchyard and governor and bearing oil in Moccasin Powerhouse was replaced.

An agreement was executed between the City and Pacific Gas and Electric Company to accommodate addition of facilities to the Company's Newark Substation. This involved the relocation of two transmission towers and installation of one new tower at the Newark terminus of City's Moccasin-Newark transmission line. The work was done by the Pacific Gas and Electric Company at no expense to the City.

Near the end of the year a contract was awarded for replacement of the radio communication system. This was required so that the system will meet "narrow band" technical standards of Federal Communications Commission becoming effective November 1, 1963. The new equipment will incorporate modern developments in mobile radio communications.

The addition of a centralized sawdust collecting system at Moccasin carpenter shop reduced health and fire hazards.

Alterations and repairs to the foundation and interior of the caretaker's cottage at Tesla Portal chlorination plant began in the latter part of the year.

Moccasin Powerhouse

After 38 years operation of Moccasin Powerhouse, deterioration of turbine runners and structural concrete, low overall efficiency of turbines, and high operating and maintenance costs made it imperative that corrective action be taken. Particularly, the deteriorated turbines are a constant hazard to plant operation.

A project planning report, prepared by a firm of consulting engineers, evaluating alternate methods of plant renewal, recommended the construction of a new plant adjacent to the present powerhouse, utilizing the existing penstocks, as the most economical solution. The total estimated cost of the proposed new plant is \$8,830,000. At the end of the year, studies were under way for financing and scheduling construction.

Canyon Power Project

In November, 1955, the electorate of San Francisco approved a \$54 million bond issue authorizing construction of two additional hydroelectric power plants to Hetch Hetchy power system. The first plant, Cherry Powerhouse, began operation on August 1, 1960.

The second plant, Canyon Powerhouse, will develop the power drop between O'Shaughnessy Dam and Early Intake Diversion Dam. At present, water released from O'Shaughnessy Dam flows down the natural stream bed of Tuolumne River to Early Intake, where it is diverted through nineteen miles of tunnel to Moccasin Powerhouse. By construction of a new pressure tunnel between O'Shaughnessy Dam and Early Intake, a power drop of approximately 1,370 feet can be realized. The total nameplate capacity of the two generators in this powerhouse will be 67,500 kilowatts.

A small unattended auxiliary power plant will be constructed in the existing diversion tunnel at O'Shaughnessy Dam. This plant will have a single 1,200-kilowatt generator which will utilize water released into Tuolumne River at the dam for the purpose of sport fishery and recreation.

At the end of the year, work on the first major portion of the Canyon Project, the power tunnel, was proceeding rapidly with approximately six miles of main tunnel completed. Headings were being driven in both directions from Hetch Hetchy Adit and the upstream heading of North Mountain Adit, the downstream heading having been "holed-through" on April 15, 1963. The tunnel will be over ten miles long, extending in almost a straight line from O'Shaughnessy Dam to the proposed Canyon Powerhouse. The tunnel will be unlined, except where concrete lining is required due to ground conditions, and where steel lining is needed to resist internal pressure adjacent to upstream and downstream portals. The unlined section will be a 14-by-14.5-foot horseshoe. A rock trap, demand and rejection galleries, and a surge shaft are to be constructed adjacent to the downstream portal. The contract also includes installation of steel conduits and a trifurcation section in the existing diversion tunnel at O'Shaughnessy Dam, and construction of a steel-lined concrete encased river crossing below the dam. All tunnel work will be completed by the latter part of 1964.

During the year, rough excavation for the penstock trench, tunnel portal, and valve house at the head of the penstock was completed. Construction work has been started on access roads to the downstream portal of the power tunnel and to the diversion tunnel at O'Shaughnessy Dam. Also, excavation for the access shaft to this tunnel and the surge shaft has been started.

The contract for furnishing impulse turbines and related equipment for Canyon Powerhouse was put out to bid twice between August, 1961 and the end of the fiscal year. Two bids were received in the first call, both rejected due to technical deficiencies. Following re-advertising, award was made to the low bidder, Pelton Division of Baldwin-Lima-Hamilton Corporation. However, the second bidder, Allis-Chalmers Manufacturing Company, filed suit to prevent certifying the award on the grounds that the low bidder's proposal did not comply with specifications because it included furnishing foreign-made parts. In its

final decision, the Superior Court ruled that all bids must be rejected. The Purchaser of Supplies issued a rescission of the award and, at the end of the fiscal year, bids were again called for under revised specifications. //

San Joaquin Pipeline No. 3

Water from Hetch Hetchy Reservoir is now brought across the San Joaquin Valley in two parallel pipelines, each 47.5 miles long. They extend from Oakdale Portal of the Foothill Tunnel in Stanislaus County, to Tesla Portal of the Coast Range Tunnel in San Joaquin County. These two lines have been operating at full capacity of 160 million gallons daily most of the time during the past four years.

Construction of San Joaquin Pipeline No. 3 began during the past year. The new line, 78 inches in diameter and paralleling the existing lines within the same right-of-way, will increase capacity of Hetch Hetchy aqueduct to approximately 295 million gallons per day. The \$22 million estimated cost of the new line will be financed by the 1961 Municipal Water System Bonds.

By the end of the fiscal year, approximately 11 miles of coal-tar enamel lined and coated steel pipe had been constructed and was under hydrostatic test. This portion was constructed in two sections of approximately the same length. The first, Section D-1, extends from Tesla Portal to the Delta-Mendota Canal, and the second, Section D-2, continues from the Delta-Mendota Canal to the west levee of the San Joaquin River. In June, a contract covering work necessary to place Sections D-1 and D-2 in service was advertised. This will increase aqueduct capacity by 10 million gallons per day. The work involves construction of a temporary cross connection between Pipelines No. 2 and 3, west of San Joaquin River, and a permanent connection of Pipeline No. 3 to Tesla Manifold. In addition, a new valve house will be constructed at Tesla Portal and alterations will be made to the chlorinating facilities there.

In June, 1963, bids were received for construction of Section B of the line, 21 miles long, which will extend from the meter house at Albers Road south of Oakdale, to the east levee of the San Joaquin River. This third section will consist of coal-tar enamel coated steel pipe with in-place cement-mortar lining. Section B will be completed by September, 1965.

At year's end, plans and specifications were in preparation for the construction of Section C crossing the San Joaquin River, connecting Sections D-2 and B, and completing the line from the Oakdale meter house to Tesla Portal, a distance of approximately 34 miles.

New Don Pedro Dam

On a cooperative basis, the City of San Francisco, Turlock and Modesto Irrigation Districts, and Corps of Engineers, U. S. Army, have agreed to further develop the Tuolumne River watershed by providing additional storage capacity. This will be accomplished by the Districts' construction of a new dam about 1½ miles downstream from their present Don Pedro Dam. In November, 1961, the electorate of San Francisco, by approving \$115 million, 1961 Municipal Water System Bonds, authorized the City's participation in this project.

The new dam will be earth and rock fill with concrete spillways, approximately 580 feet high and 800 feet long with a storage capacity of 2,030,000 acre-feet, seven times that of the present reservoir. This will provide necessary increase in storage space for the City in lieu of constructing more expensive facilities in the upper watershed. It will also provide additional storage space for irrigation and power generation for the Irrigation Districts. Further, it will augment flood control space for the Corps of Engineers in its program for protection of the lower Tuolumne River from flood damage. The increase in storage capacity will enable San Francisco to meet the estimated water requirements of the City and its service area until the year 2015. The two Irrigation Districts will furnish the damsite, which they now own, and the lands which will be covered by the new reservoir. The City of San Francisco will supply an estimated \$42 million, and the Federal Government an estimated \$5 million toward the cost of the dam.

A hearing on the Turlock and Modesto Irrigation Districts' application for licensing the New Don Pedro Project was held by the Federal Power Commission in San Francisco in October, 1962. Testimony was presented by Modesto and Turlock Irrigation Districts, the City, Tuolumne County, State Department of Fish and Game, Department of the Interior, Banta-Carbona Irrigation District, and the Federal Power Commission staff. Legal briefs were filed later by the participants. On June 4, 1963, the examiner who conducted the hearing for the Federal Power Commission filed an initial decision which recommended issuance of a 50-year license to the Districts for the proposed project. This decision is subject to a number of conditions including water releases for preserving and enhancing the fish resources of the Tuolumne River and the development of the project area for recreational purposes. At the end of the year the initial decision was being studied by all parties concerned.

Surplus Property

During the year the following parcels of surplus Hetch Hetchy property were sold for the Department by the City's Director of Property:

<u>Parcel</u>	<u>Sold To</u>	<u>Amount</u>	<u>Original Purchase Price and Date</u>
0.11 of an acre in Dumbarton Tract, San Mateo County	Nellie O. Paget	\$3,500	\$260.00 (1923)
38.17 acres in vicinity of Big Creek Shaft, Tuolumne County	Arthur Holliday	\$3,625	\$763.40 (1917)
20.56 acres of former Hetch Hetchy Railroad right-of-way, Tuolumne County	Robert D. Dunn	\$2,060	\$675.00 (1916)

State Legislation

A complete review was made of all water legislation introduced in the State Legislature during the 1963 session. In conjunction with the Water Department and the City Attorney's office, approximately 150 bills were analyzed for their effect on the City's water and power operations. Joint recommendations were made to the Manager of Utilities for action through the Mayor's Legislative Committee.

Twenty-seven Senate bills and forty-two Assembly bills were of particular interest. Personal appearances were made at legislative committee hearings by the General Manager either in support of or opposition to specific legislation. No bills were enacted which could be considered as directly contrary to the interests of the Department.

Status of Hetch Hetchy Construction Contracts

A summary of Hetch Hetchy construction contracts in progress during the fiscal year 1962-63 is shown in Table 16.

III. AIRPORT ENGINEERING AND CONSTRUCTION

General

Improvements at San Francisco International Airport to meet the demands of increasing jet-age traffic, continued at a rapid pace during the fiscal year. Although growth and expansion were exhibited in many facets of the Airport operation the major construction development was concentrated in the terminal complex. The South Terminal building and aircraft apron were nearing completion, and construction of a parking garage was about to begin. These and other additional and expanded facilities were being planned, designed, and constructed under the \$25 million Airport bond issue of 1956 and the \$9.8 million Airport bond issue of 1962.

A map showing the Master Plan for the San Francisco International Airport is included in the Appendix.

Construction Progress

The second terminal building, designated the South Terminal, and associated Piers F and G were nearing completion at end of the fiscal year, with opening of these facilities scheduled for September, 1963. Work was being done on all phases of interior finishing and installation of elevators, escalators, and conveyor systems. The steel-framed building, covering an area of 90,000 square feet excluding piers, will be initially occupied by nine airlines.

Work on associated major improvements in the terminal complex was scheduled so that their completion would be ahead of or coincide with that of the terminal structure. These projects include: an elevated road connecting the South and Central Terminal buildings at the second level, realignment of the ground level road and utilities; and construction of aircraft apron pavement, servicing facilities for Piers F and G, and service parking areas.

Work on concurrent contracts was well advanced on other features needed to make the new terminal building and piers operational. Among these are installation of: a public address system with approximately 400 loudspeakers, an automatic flight announcer console with a selector panel in each waiting room of Piers E, F, and G, and air circuit breakers at Power Station A, current limiting reactor and oil switches at Power Station E, and power feeder cables.

A major contract for construction of the first stage of the four-level parking garage and related facilities was awarded in June, 1963, with work to be started in July. This initial portion of the structure will accommodate approximately 2,350 automobiles. First stage construction, scheduled to be completed in 1965, will include the garage structure, a connecting tunnel to the Central Terminal building, entrance and exit ramps and structures, and relocation of road and utilities. In order to make the site available for construction, certain parking facilities were being relocated. A shuttle bus service for parking patrons was being planned to provide free transportation between the parking areas and the terminal complex during the construction.

By the end of the fiscal year, a hexagon-shaped three-story addition to Pier C was more than half completed. A portion of the pier was removed to accommodate the addition. Work under this contract also includes remodeling of existing areas and removal of the temporary walkways and gate rooms which were built last year to facilitate this construction.

Improvements to the Central Terminal building and piers proceeded throughout the year. Two additional rotary-type baggage dispensers were installed on the ground floor in the south half of the building as part of a general improvement of the baggage claim area. Floodlights, street lights, and traffic signals were installed at the Central Terminal building, along with floodlights and emergency lights at Pier D. Remodeling on the fourth floor of the Central Terminal building provided an additional office for Airport personnel. Installation of finish walls, ceiling, lighting, heating and ventilation, in Room G-20 of Pier C, was started.

Fill for the easterly extension of Runway 28L was completed last year. Paving this extension for a distance of 2,370 feet, bringing the total paved length to 9,500 feet, was approximately one-fourth completed. The current contract includes removal and redistribution of an earth surcharge load, the construction of runway, taxiway, and warm up apron pavements, and field lighting.

Runway 1L-19R, which had deteriorated by aging, weathering, repeated aircraft loadings and differential settlement, was returned to structural soundness and smoothness. This work included removal and reconstruction of central portions of bituminous pavement and placement of asphaltic overlay on much of the remaining runway. Pavement overlays were placed on various sections of other runways and taxiways to correct uneven surfaces. The central 45 feet of Taxiway G, between Runway 1R and Taxiway B, was removed and replaced with concrete pavement.

Timber structures for the support of a modified approach lighting system to be installed by the Federal Aviation Agency to facilitate instrument approaches to Runway 19L has been completed. These pile-supported structures extend from the Airport shoreline over the waters of San Francisco Bay to the seaplane channel.

Construction for relocation of a service road and site preparation to accommodate a wave guide localizer has been started. This is for an instrument landing system to be installed at the west end of Runway 10L-28R by the F.A.A. Because this installation will restrict traffic on a portion of Old Bayshore Highway, road relocation was necessary.

In order to permit approaching aircraft to pre-empt the right-of-way at the intersection of Taxiway S and the service road, a contract was awarded for the installation of aircraft detectors, vehicle control gates, street lights, traffic signals, and traffic islands.

A portion of Taxiway R was paved to provide aircraft access to new tenant's facilities on Plot 10. At the five gate positions of Pier B, certain areas of deteriorated asphaltic pavement were replaced with concrete pads for the support of aircraft main gear. The deteriorated surfaces of certain taxiway and apron asphaltic concrete pavements were scheduled to be revitalized and sealed with an application of petroleum oils and resins.

Additional parking area adjacent to the west end of the employees' parking lot was constructed. Upon completion of the extension of Road R-2 from the TWA hangar to the main entrance road, direct vehicular access to the terminal area was provided for Plots 3, 3B, and 3C.

Status of Airport Construction Contracts

A summary of Airport construction contracts in progress during the fiscal year 1962-63 is shown in Table 17.

Planning for Future Development

Engineering work for Federal Aid Program Project No. 9-04-034-C320 was completed. A grant offer was received from Federal Aviation Agency of approximately \$550,000 toward the cost of the project. The application for these funds included preparation of an engineering report and plans and specifications for the following construction scheduled for the coming fiscal year:

1. A high speed exit taxiway enabling aircraft to vacate Runway 28L in an appreciably shorter time and distance than possible on the standard taxiway.
2. First portion of Taxiway H, parallel to Runway 1R-19L, to provide additional aircraft access between the South Terminal area and Runways 28L and 28R.
3. South Terminal apron extension, to provide additional aircraft parking space for future Pier F-F and apron taxiway for aircraft proceeding to Piers F, F-F, and G.
4. Reconstruction of a portion of Runway 10L-28R pavement, to correct differential settlement.
5. Replacement of asphaltic pavement with concrete pads at aircraft loading positions at Piers C and E.
6. Drainage Pumping Plant No. 3, at the Terminus of the Millbrae Canal, to supplement the gravity system for disposal of storm water originating from neighboring communities.
7. Chain link fencing at certain Airport boundary lines and along portions of the landing field area to prevent access to the field by the general public.

Federal aid was requested for several additional projects to be scheduled for fiscal year 1963-64. The major work under this program will be the 900-foot bayward extension of Runway 28R bringing the total length to 10,600 feet. This is the first stage of a proposed extension to 11,870 feet to increase the runway's capacity and safety. Other projects for this program include: extension of Taxiway R to provide access to the maintenance base area, and additions to the power distribution system for increasing electrical energy requirements of the Airport.

The terminal complex was receiving its share of attention, with plans and specifications being developed for an airline waiting room at Gate 57 of Pier F, and exterior signs and related work for the parking garage. At the end of the year, two contracts were out for bids: one, for gate room stairways at Pier G, baggage claim area finishing, and South Terminal directional signs, and the other, for exterior painting of the Central Terminal building.

Other improvements which were under study or in the planning, schematic, or preliminary stages include: interim facilities for Pier F-F, the construction of Pier F-F, the construction of Cargo Building No. 4, utilization of Plot 17, utilization of Airport lands west of Bayshore Freeway, and alterations to the Central Terminal building to increase the building's passenger-handling capability in order to meet jet-age standards.

Specifications were completed for the installation of moving sidewalks between Piers B and C, which the City proposes to lease for one year with an option to buy.

The Department participated in determining furniture requirements for the South Terminal building, by developing standards, procedures, and technical specifications, and will assist in the final selection early in July.

Measurement survey of aircraft noise in the Bayside Manor area was conducted under direction of the Department. Results of this survey indicated that perceived noise levels are of shorter duration and 30 to 50 percent quieter than they were two or three years earlier.

The Department continued its technical assistance to various Airport tenants in the development of plans for improvements, and in the latter half of the year, assumed responsibility for inspection of these improvements during construction. Lease drawings were developed for all South Terminal and Pier C tenants.

Financing

At the end of the fiscal year, \$26,860,000 was spent under the \$25 million 1956 Airport bond program which has been supplemented by Federal aid for the development of the Airport.

During the year, \$550,000 from Airport revenue and \$700,000 from the 1956 bond fund were appropriated for remodeling of the Central Terminal building. Also, funds were appropriated from Airport revenue as follows: \$50,000 for reconstruction of apron pavement, \$90,000 for paving of auto parking areas, and \$110,000 for additional aircraft parking apron.

Through the Federal Aviation Agency, the Federal Government allocated \$550,596 to the City for subvention for construction of additional landing field pavement and drainage system improvements. During the year, funds received from Federal Aviation Agency for construction work completed under approved grants totaled \$963,149.

A \$9.8 million bond issue was approved by the electorate in June, 1962, for the first stage of a multilevel parking garage. In order to certify the major contract for this project, the Controller sold the full amount of the bond issue in April, 1963. The major contract for construction of this facility was awarded in June, 1963. No funds for construction had been spent at the close of the fiscal year.

Taxes

The following tabulation shows total taxable land area, total assessed valuation, and total taxes paid for the San Francisco International Airport property in San Mateo County for the fiscal year 1962-63 as compared with the two previous years:

	<u>1960-61</u>	<u>1961-62</u>	<u>1962-63</u>
Total Taxable Area (acres)	4,954.24	4,947.14	4,947.14
Total Assessed Value	\$1,188,590	\$1,196,995	\$1,197,430
Total Amount Taxes Paid	\$ 89,479	\$ 89,334	\$ 94,254

The San Mateo County Assessor's office has recently conducted a re-evaluation of the San Francisco International Airport property. Based on the new proposed assessed values the assessment of the Airport's property would be increased from \$1,197,430 to \$3,924,800. This would increase taxes for the fiscal year 1963-64 from \$94,259 to over \$300,000. The City and County of San Francisco will appeal the proposed increased assessment before the State Board of Equalization in August, 1963.

IV. MUNICIPAL RAILWAY ENGINEERING AND CONSTRUCTION

General

Work continued on the design and preparation of plans and specifications for rehabilitation work on Municipal Railway properties. In addition, plans were prepared for changes to the facilities made necessary by the Freeway construction program of the State of California.

Construction work during the fiscal year was financed from the Municipal Railway Operating Fund, the Municipal Railway Reconstruction and Replacement Fund, and by the State of California.

Projects started or completed during the fiscal year are described below.

Overhead Construction

The rehabilitation of "Path of Gold" trolley poles on Market Street between the Embarcadero and Gough Street has been completed.

The following work required for construction of the Southern Freeway has been completed: permanent installation of trolley coach overhead feeders and trolley wires at Mission Viaduct, temporary relocation of trolley coach and streetcar overhead feeders and trolley wires on Ocean Avenue, and relocation of overhead feeders on Ocean Avenue and San Jose Avenue.

Buildings and Structures

During the year, work on buildings and structures for oil pipe repairs at Washington-Mason Powerhouse and water service replacement at Forest Hill Station has been completed.

Track Construction

Work required for construction of the Southern Freeway included: temporary track detour on Ocean Avenue, which has been completed, and track removal, track construction, and relocation of a quonset hut at Elkton Yard, which have been started.

Miscellaneous

The installation of jaw clutches for the cable driving machinery at Washington-Mason Powerhouse has been completed.

At the end of the year, bids were received and award was made for the replacement of the Municipal Railway radio system.

Status of Municipal Railway Construction Contracts

A summary of Municipal Railway construction contracts in progress during the fiscal year 1962-63 is shown in Table 18.

Rapid Transit

At the beginning of the year, an agreement was signed whereby the Bay Area Rapid Transit District would pay relocation costs on all City-owned utilities. On November 6, 1962, the voters of San Francisco approved by a vote of 163,559 to 80,967 (a 66.88 percent majority), the construction of a rapid transit system as embodied in "Composite Report of May 1962", prepared by the Rapid Transit District. Shortly thereafter, the Contra Costa County Superior Court issued a restraining order whereby the District was enjoined from paying any consultant fees. This order precluded any appreciable progress for six months; it was finally rescinded on June 10, 1963, and engineering design work was resumed.

During the year, a study was made of the Rapid Transit right-of-way location along the Southern Freeway and the design of the Ocean Avenue Station at the Municipal Railway Elkhorn Shops. Preliminary studies were made for Municipal Railway changes to avoid duplication and to coordinate with the rapid transit system. A turnback loop for streetcars at Drumm and Market Streets was also studied. The Utilities Engineering Bureau has prepared a suggested form of procedure for securing reimbursement from the District for related engineering work.

V. STREET LIGHTING

General

The lighting of public streets within the City and County of San Francisco is provided by City-owned facilities, by facilities furnished under an annual contract with the Pacific Gas and Electric Company, and by jointly-owned facilities of the City and the Company.

During the year 1962-63, maintenance and repair of City-owned installations was performed under contract and included group lamp replacements, painting, repair of defective and damaged equipment, and miscellaneous work. Under another contract the Pacific Gas and Electric Company furnished street lighting service including maintenance of Company-owned equipment, switching and control of street lighting circuits, and emergency work as required. Electric energy for all street lighting operation within the City was supplied from the City's Hetch Hetchy power system.

Studies were continued on the overall requirements for illumination of public streets. Detail planning and design for changes, improvements, and additions to City-owned facilities in connection with street improvement projects were performed by the Bureau of Engineering of the Department of Public Works. Final plans are subject to approval of the Public Utilities Commission through the Bureau of Light, Heat and Power.

Operation and Maintenance

As of June 30, 1963, the total of City-owned and Company-owned street lights in service in public streets, parks, viaducts, tunnels, and underpasses was 29,355, an increase of 221 during the year. Table 11 shows a summary of the number and types.

During the fiscal year, a total of \$956,265 was expended for the operation, maintenance, and repair of the street lighting system in San Francisco. This is \$78,734 less than the previous year due to a 21 percent discount for Hetch Hetchy energy used for municipal purposes. The year's cost per unit averaged \$32.58. Of the total expenditure, \$11,649 was paid by the State. This covered the State's share of the cost of operation and maintenance of street lighting at intersections on City streets which are part of the State highway system.

A summary of expenditures for the fiscal year is shown in Table 12.

Improvements

New City-owned street lighting installations completed during the year cost \$106,028. A summary of these improvements is shown in Table 14.

Complaints and Damages

During the year, 136 complaints and requests for service in connection with street lighting operations were investigated and acted upon. These involved complaints of inadequate illumination, objectionable glare in windows, and requests from property owners for relocation of street lighting poles.

In 1962-63, there were 85 accidents involving damage to City-owned street lighting property. In each case, investigation was made as soon as possible to ensure removal of hazards to the public and obstructions to traffic, and efforts were made to secure reimbursement for the cost of repairs from the party responsible for the damage. Cost of repairs to damaged City-owned street lighting property totaled \$35,692.

A summary of accidents, cost of repairs, and collections is shown in Table 13.

VI. UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments was generated by the City's Hetch Hetchy power system and delivered to the various service points by transmission and distribution facilities of the Pacific Gas and Electric Company under a wheeling contract. The natural gas and steam supplied to municipal departments was furnished by the Pacific Gas and Electric Company under the provisions of its contract with the Department.

Municipal Consumption of Electricity, Gas, and Steam

During the fiscal year 1962-63, a total of 270,930,736 kilowatt-hours of electricity was supplied through 810 accounts for municipal uses, including street lighting and traffic devices. A total of \$2,886,035 for electricity by the City departments was paid through the Department to the Hetch Hetchy Project. [At the same time, 13,822,622 hundred cubic feet of natural gas was consumed through 505 accounts, and 1,922,000 pounds of steam was used through one account, for which Pacific Gas and Electric Company was paid \$784,749 and \$3,879 respectively.]

✓ The Pacific Gas and Electric Company reduced gas rates \$0.01186 per 1,000 cubic feet effective February 1, 1963. This will decrease the cost of gas used by municipal departments about \$20,000 a year. ✓

A summary of consumption and expenditures for these commodities supplied to each municipal department is shown in Tables 9 and 10.

San Francisco International Airport

The Department rendered service to the San Francisco International Airport in the operation of the City-owned electric distribution system within the Airport boundary. This service included supervising installation and testing of the associated metering facilities, performing the necessary monthly meter readings, and preparing the corresponding billings for presentation by the Airport Department to private tenants. During the fiscal year, 79 tenants were supplied a total of 53,965,114 kilowatt-hours of electricity through 239 metered and 57 unmetered accounts, for which the Airport Department collected \$680,099.

TABLE 1
HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)
FISCAL YEAR 1962-63

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110	Permanent Salaries	\$ 307,854	\$ 279,626	\$ -28,228
111	Allowance for Overtime	2,208	2,075	-133
112	Allowance for Holidays	8,469	1,705	-6,764
113	Extended Work Week	25,132	17,851	-7,281
120	Temporary Salaries	22,050	8,759	-13,291
130	Wages (Net Appropriation)	630,862	629,788	- 1,074
139	Wages (Gardeners)	23,280	22,589	-691
	Subtotal (Personal Services)	\$ 1,019,855	\$ 962,393	\$ -57,462
200	Contractual Service	41,275	52,615	11,340
216	Maint. & Repair of Auto Equip.	32,000	30,980	-1,020
231.0	Heat, Light and Power	2,210	2,355	145
231.1	Purchase of Power for Resale	744,400	226,974	-517,426
231.2	Service Charge for Transm. & Dist.	1,889,200	1,886,466	-2,734
251	Subsistence of Employees	18,000	8,837	-9,163
295	Legislative Expense	5,000	2,401	-2,599
300	Material and Supplies	68,750	62,752	-5,998
350	Foodstuffs	12,581	11,823	-758
640	Water Rights and Damage Claims	22,750	11,172	-11,578
641	Hydrography	27,222	27,178	-44
801	Accident Compensation	6,000	8,799	2,799
812	Fidelity Insurance	53	43	-10
813	Automobile Insurance	4,060	3,070	-990
814	Fire Insurance	11,500	6,206	-5,294
815	Miscellaneous Insurance	10,000	7,689	-2,311
854	Membership Dues	171	146	-25
855	Fee to U.S. Gov't. - Raker Act	30,000	30,000	-0-
856	Maint. Roads & Trails - Raker Act	25,000	26,355	1,355
860	Retirement Allowance	67,510	62,286	-5,224
862	Social Security	14,616	15,178	562
865	Health Service System	15,080	14,701	-379
870	Taxes	600,000	190,898	-409,102
880	Rentals - Transmission Lines	54,000	54,000	-0-
900	Services of Other Depts.	379,517	368,231	-11,286
	TOTAL OPERATION AND MAINTENANCE	\$ 5,100,750	\$ 4,073,548	\$ -1,027,202
400	Equipment	22,635	20,767	-1,868
756	Reconstruction and Replacement	73,174	73,174*	-0-
757	Additions and Betterments	1,200	1,200*	-0-
800	Bond Interest and Redemption	8,801,335	8,145,052	-656,283
	TOTAL	<u>\$13,999,094</u>	<u>\$12,313,741</u>	<u>\$-1,685,353</u>

*Unexpended balance transferred to unallocated balance of appropriation.

TABLE 2
HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1962-63

	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER OVER</u>
<u>RECEIPTS</u>			
Revenue from Sale of Electric Energy	\$ 9,307,100	\$ 8,930,781	\$-376,319
Revenue from Sale of Water and Standby Charge, SFWD	5,000,000	5,000,000	-0-
Other Revenue	65,000	117,238	52,238
	<hr/>	<hr/>	<hr/>
TOTAL GROSS REVENUE	\$14,372,100	\$14,048,019	\$-324,081
 <u>EXPENDITURES</u>			
Total Expenditures (from Table 1)	\$13,999,094	\$12,313,741	\$-1,685,353
	<hr/>	<hr/>	<hr/>
<u>EXCESS OF REVENUE OVER EXPENDITURES</u>	\$ <u>373,006</u>	\$ <u>1,734,278</u>	\$ <u>1,361,272</u>

TABLE 3
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

<u>SEASON PRECIPITATION (INCHES)</u>	<u>Normal</u>	<u>1958-59</u>	<u>1959-60</u>	<u>1960-61</u>	<u>1961-62</u>	<u>1962-63</u>
Hetch Hetchy	33.77	24.41	26.10	23.38	33.57	40.08
Lake Lloyd	---	29.77	39.32	24.47	48.48	52.33
Approx. Percent of Normal		72%	77%	69%	99%	118%
<u>WATERSHED RUNOFF (ACRE-FT.)(a)(e)</u>						
Hetch Hetchy	723,100	423,656	494,776	375,434	783,989	818,000(b)
Lake Lloyd	263,300	189,230	(297,039	(203,059	(446,178	(490,000(b)
Lake Eleanor	157,900	100,884				
Total	<u>1,144,300</u>	<u>713,770</u>	<u>791,815</u>	<u>578,493</u>	<u>1,230,167</u>	<u>1,308,000(b)</u>
Approx. Percent of Normal		62%	69%	52%	108%	114%
<u>RESERVOIR STORAGE (ACRE-FT.)(e)</u>						
No-Spill Capacity						
Hetch Hetchy	360,360	315,258	297,730	195,572	355,244	353,480
Lake Lloyd	268,200	80,792(c)	124,868	69,973	248,577	266,112
Lake Eleanor	27,100	4,198(c)	11,414	11,331	26,436	25,681
Total	<u>655,660</u>	<u>400,248</u>	<u>434,012</u>	<u>276,876</u>	<u>630,257</u>	<u>645,273</u>
<u>DELIVERY TO SFWD (ACRE-FT.)(e)</u>						
Average per day		316	489	445(d)	482(d)	386(d)
Maximum per day		493	502	500(d)	502(d)	494(d)
Total for fiscal year		115,398	179,154	162,547(d)	175,903(d)	140,769(d)
Total since operation of Hetch Hetchy Aqueduct began 1934.						2,169,137(d)

- NOTES: (a) For Water Year, November 1 to October 31.
 (b) Estimated.
 (c) Drawn down to permit construction of Eleanor-Cherry Diversion Tunnel.
 (d) Includes delivery to Livermore site, U. S. Atomic Energy Commission.
 (e) One acre-foot equals 325,900 gallons or approximately $1\frac{1}{3}$ million gallons.

TABLE 4
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1962-63

<u>PLANT DATA</u>	<u>Capacity (Kilowatts)</u>		<u>Annual Load Factor - %</u>
	<u>Rated</u>	<u>Short Time</u>	
Moccasin Powerhouse	70,000	82,000	73.5
Cherry Powerhouse	135,000	152,000	57.1
Early Intake Powerhouse	<u>3,600</u>	800	---
Total	208,600	206,000(a)	

ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)

<u>Gross Generation</u>			
Moccasin Powerhouse	528,140,000		
Cherry Powerhouse	760,329,000		
Early Intake Powerhouse (b)	<u>29,100</u>		1,288,498,100
<u>Station Service</u>			
Moccasin Powerhouse	807,100		
Cherry Powerhouse	1,265,020		
Early Intake Powerhouse (b)	<u>110</u>		2,072,230
<u>Net Generation</u>			1,286,425,870
<u>Supplementary Energy</u>			
P.G.& E. Co. (Replacement)	10,765,908		
P.G.& E. Co. (Purchase)	<u>17,614,531</u>		28,380,439
<u>Total</u>			<u>1,314,806,309</u>

ENERGY DISTRIBUTED (KILOWATT-HOURS)

<u>Sales</u>		
Municipal Accounts		271,930,805
Modesto Irrigation District		343,344,000
Turlock Irrigation District		118,483,000
Permanente Cement Company		138,773,712
Kaiser Aluminum and Chemical Corporation		14,424,000
Dow Chemical Company		301,810,584
Hercules Powder Company		23,544,000
Miscellaneous Customers		9,010,930
<u>Non-Revenue</u>		
Project Use		3,314,272
Pacific Gas and Electric Company (Replacement)		8,440,168
<u>Losses</u>		
Hetch Hetchy System		26,080,028
P.G.& E. System (Municipal and Industrial Accounts)		<u>55,645,810</u>
<u>Total</u>		<u>1,314,806,309</u>

NOTES: (a) Coincidental Demand (b) On standby

TABLE 5
HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY CONSUMPTION BY CUSTOMERS
FISCAL YEARS 1961-62 AND 1962-63

(Nearest 100,000 Kilowatt-Hours)

<u>CUSTOMER</u>	<u>1961-62</u>	<u>1962-63</u>
Municipal Accounts		
Street Lighting	36,300,000	36,300,000
Public Works	18,400,000	17,900,000
S. F. International Airport	62,500,000	64,400,000
Municipal Railway	66,400,000	67,000,000
Water Department	32,800,000	29,500,000
S. F. Unified School District	17,400,000	19,200,000
Other City Departments	34,500,000	37,600,000
Modesto Irrigation District	354,000,000	343,300,000
Turlock Irrigation District	170,600,000	118,500,000
Permanente Cement Company	141,300,000	138,800,000
Kaiser Aluminum and Chemical Corp.	13,800,000	14,400,000
Dow Chemical Company	156,100,000	301,800,000
Hercules Powder Company	---	23,600,000
All Other Sales	600,000	9,000,000
	<u>1,104,700,000</u>	<u>1,221,300,000</u>
TOTAL		

TABLE 6
HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1961-62 AND 1962-63

(Nearest \$1,000)

<u>CUSTOMER</u>	<u>1961-62</u>	<u>1962-63</u>
Municipal Accounts		
Street Lighting	\$ 488,000	\$ 386,000
Public Works	251,000	218,000
S. F. International Airport	546,000	555,000
Municipal Railway	711,000	678,000
Water Department	294,000	261,000
S. F. Unified School District	314,000	321,000
Other City Departments	496,000	500,000
Modesto Irrigation District	2,092,000	1,762,000
Turlock Irrigation District	1,010,000	625,000
Permanente Cement Company	1,205,000	1,200,000
Kaiser Aluminum Chemical Corp.	93,000	98,000
Dow Chemical Company	1,065,000	2,066,000
Hercules Powder Company	---	160,000
All Other Sales	8,000	101,000
	<u>\$8,573,000</u>	<u>\$8,931,000</u>
TOTAL		

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS - KILOWATTHOURS						
	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63
NET GENERATION						
Moccasin Powerhouse	522,575,450	527,023,100	519,258,400	469,300,100	390,534,500	527,332,900
Cherry Powerhouse	---	---	---	451,179,360	398,956,200	759,063,980
Early Intake Powerhouse	32,690,647	27,876,552	17,951,026	1,749,306	0	28,990
Subtotal	555,266,097	554,899,652	537,209,426	922,228,766	789,490,700	1,286,425,870
SUPPLEMENTARY ENERGY						
P.G. & E. Co. (Replacement)	---	---	---	---	---	10,765,908
P.G. & E. Co. (Purchase)	135,797,585	202,433,126	384,528,298	116,235,950	401,108,639	17,614,531
Subtotal	135,797,585	202,433,126	384,528,298	116,235,950	401,108,639	28,380,439
TOTAL	691,063,682	757,332,778	921,737,724	1,038,464,716	1,190,599,339	1,314,806,309
DISTRIBUTION						
Sales						
Municipal Accounts	220,814,868	235,557,361	252,584,748	257,641,932	268,283,987	271,930,805
Modesto Irrig. Dist.	179,601,000	192,134,400	300,501,600	348,864,000	353,976,000	343,344,000
Turlock Irrig. Dist.	36,621,604	66,007,346	130,742,402	140,960,571	170,649,231	118,488,000
Permanente Cement Co.	156,458,000	166,572,310	152,045,469	140,774,680	141,273,870	138,773,712
Kaiser Aluminum Corp.	14,616,000	12,000,000	13,272,000	13,152,000	13,776,000	14,424,000
Dow Chemical Co.	---	---	---	44,011,368	156,102,552	301,810,584
Hercules Powder Co.	---	---	---	---	---	23,544,000
Riverbank Ord. Plant	4,587,573	---	---	---	---	---
Misc. Customers	2,528,934	6,595,970	4,197,071	665,872	650,398	9,010,930
P.G. & E. Co. (Dump)	97,296	---	---	1,060,607	---	---
Non-Revenue	3,439,500	3,007,776	3,246,239	3,168,162	3,535,696	3,314,272
Project Use	---	---	---	---	13,426,572	8,440,168
P.G. & E. Co. (Replacement)	---	---	---	---	---	---
Losses	72,298,907	75,467,615	65,148,195	64,172,524	68,925,033	81,725,838
TOTAL	691,063,682	757,332,778	921,737,724	1,038,464,716	1,190,599,339	1,314,806,309

TABLE 8
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1962-63

<u>O.E.</u>	<u>Description</u>	<u>Budget</u>	<u>Actual</u>	<u>-Under Over</u>
<u>EXPENDITURES</u>				
110	Permanent Salaries	\$ 96,047	\$ 88,233	\$-7,814
111	Allowance for Overtime	860	14	-846
200	Contractual Services	3,080	1,502	-1,578
214	Alteration and Repair of Street Lighting Structures (City-owned)	2,500	2,274	-226
214.1	Maintenance and Repair of Street Lighting Installa- tions (City-owned)	92,700	92,109	-591
231.1	Public Building Light and Heat	186,630	173,734	-12,896
231.2	Lighting of Public Streets (Pacific Gas and Electric Co.)	483,750	483,259	-491
231.3	Lighting of Public Streets (Hetch Hetchy)	380,120	374,084	-6,036
231.XXX	Elect. and Gas-Interdepart.	3,249,560	3,197,168	-52,392
300	Materials and Supplies	725	725	-0-
400	Equipment	225	-0-	-225
801	Accident Compensation	100	-0-	-100
813	Auto Insurance	300	261	-39
860	Retirement Allowance	5,798	5,652	-146
862	Social Security	1,392	1,476	84
865	Health Service System	1,958	2,085	127
		<u>\$4,505,745</u>	<u>\$4,422,576</u>	<u>\$-83,169</u>

RECEIPTS

Interfund Receipts*	\$3,275,560	\$3,223,168	\$-52,392
Ad Valorem Taxes	1,230,185	1,199,408	-30,777
	<u>\$4,505,745</u>	<u>\$4,422,576</u>	<u>\$-83,169</u>

*Transfers from other departments.

TABLE 9
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1962-63

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION KILOWATT-HOURS</u>	<u>EXPENDITURE</u>
Art Museum	-	504,504	\$ 6,304
Child Care Centers	8	67,274	1,740
City Planning	1	66,640	1,394
De Young Museum	2	415,840	6,496
Disaster Corps	2	2,526	103
Electricity	6	309,600	5,510
Farmers Market	1	7,004	186
Fire (a)	60	1,662,178	37,645
Hassler Health Home	1	628,560	7,199
Health	21	6,323,180	65,860
Hetch Hetchy	6	76,128	2,197
International Airport (Incl.resale)	8	64,421,478	554,765
Legion of Honor	5	293,392	5,676
Library	30	1,964,574	33,803
Log Cabin Ranch	9	219,208	6,058
Municipal Railway	39	67,052,838	677,814
Police	18	553,199	12,049
Public Buildings	8	11,689,952	111,371
Public Welfare	2	324,920	4,636
Public Works	49	17,885,445	213,508
Purchasing	7	335,856	5,557
Real Estate - Auditorium	2	1,220,280	16,654
Recreation and Park	182	7,272,791	121,534
S. F. Unified School District	241	19,180,140	321,319
Sheriff	2	780,800	8,341
Street Lighting Operations	-	36,339,702	374,084
War Memorial - General	2	776,296	10,884
Water	97	29,452,911	261,286
Youth Guidance	1	1,103,520	12,062
TOTAL MUNICIPAL DEPARTMENTS	810	270,930,736	\$ 2,886,035
Academy of Sciences	6	1,000,069	13,402
Flower Show	-	(b)	1,356
Mount Davidson Cross Lighting	-	(b)	1,300
State of Calif: Street Lighting	1	(c)	11,649
Traffic Devices	1	(d)	4,990
TOTAL FROM HETCH HETCHY		271,930,805	\$ 2,918,732
Fire Dept., For Resale to Fort Mason	1	4,424,200	53,685
GRAND TOTAL	819	276,355,005	\$ 2,972,417

NOTES: (a) Does not include electricity purchased for resale to Fort Mason
 (b) Included under Recreation and Park
 (c) Included under Street Lighting Operations
 (d) Included under Public Works

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1891	Vol. 21	Part 1	No. 1
1892	Vol. 22	Part 2	No. 2
1893	Vol. 23	Part 3	No. 3
1894	Vol. 24	Part 4	No. 4
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1896	Vol. 26	Part 6	No. 6
1897	Vol. 27	Part 7	No. 7
1898	Vol. 28	Part 8	No. 8
1899	Vol. 29	Part 9	No. 9

TABLE 10
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1962-63

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION HUNDRED CU. FT.</u>	<u>EXPENDITURE</u>
Child Care Centers	8	22,458	\$ 1,557
City Planning	1	5,628	375
DeYoung Museum	2	62,400	3,577
Disaster Corps	1	400	39
Electricity	4	12,534	844
Farmers Market	1	435	42
Fire	58	609,037	38,542
Hassler Health Home	2	283,451	18,305
Health	19	3,904,383	187,665
Hetch Hetchy	2	1,842	158
International Airport	12	716,941	37,735
Library	28	92,240	6,283
Municipal Railway	12	241,504	15,564
Police	10	56,951	3,791
Public Building	4	1,191,610	62,363
Public Works	11	320,085	22,822
Purchasing	4	57,807	3,607
Real Estate - Auditorium	2	1,054	92
Recreation and Park	99	1,200,846	75,964
Registrar of Voters	1	11,435	835
S. F. Unified School District	202	3,966,976	244,799
Sheriff	2	351,927	18,931
Single Men's Rehabilitation Center	1	39,512	2,415
War Memorial - General	3	195,364	12,293
Water	14	60,936	4,222
Youth Guidance	2	414,866	21,929
TOTAL MUNICIPAL DEPARTMENTS	505	13,822,622	784,749
Academy of Sciences	2	79,573	4,988
GRAND TOTAL	<u>507</u>	<u>13,902,195</u>	<u>\$789,737</u>

STEAM

(Does not include steam generated by City)

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION POUNDS</u>	<u>EXPENDITURE</u>
Public Welfare	1	1,922,000	\$ 3,879

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1963

<u>SIZE & TYPE OF LAMP</u>	<u>COMPANY- OWNED</u>	<u>JOINTLY- OWNED</u>	<u>CITY- OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTED</u>				
<u>High voltage series circuit</u>				
1,000 Lumen Incandescent	--	22	--	22
2,500 " "	328	263	477	1,068
4,000 " "	2,439	566	2,865	5,870
6,000 " "	793	643	4,717	6,153
10,000 " "	407	45	560	1,012
23,000 " Fluorescent	5	--	25	30
400 Watt Mercury Vapor	18	--	68	86
1,000 " Mercury Vapor	--	--	3	3
<u>Low voltage multiple circuit</u>				
1,000 Lumen Incandescent	--	--	173	173
2,500 " "	8	--	13	21
4,000 " "	189	3	50	242
6,000 " "	81	9	36	126
10,000 " "	2	--	16	18
23,000 " Fluorescent	36	--	100	136
100 Watt Mercury Vapor	--	--	2	2
175 " Mercury Vapor	--	--	50	50
250 " Mercury Vapor	--	--	43	43
400 " Mercury Vapor	718	--	254	972
<u>OVERHEAD CONNECTED</u>				
<u>High voltage series circuit</u>				
2,500 Lumen Incandescent	272	--	--	272
4,000 " "	12,141	--	57	12,198
6,000 " "	262	--	2	264
<u>Low voltage multiple circuit</u>				
2,500 Lumen Incandescent	21	--	--	21
4,000 " "	363	--	1	369
6,000 " "	157	--	18	175
10,000 " "	--	--	1	1
175 Watt Mercury Vapor	25	--	--	25
250 " Mercury Vapor	1	--	2	3
 TOTAL AS OF JUNE 30, 1963	<u>18,271</u>	<u>1,551</u>	<u>9,533</u>	<u>29,355</u>
	62.24%	5.28%	32.47%	100%
 TOTAL AS OF JUNE 30, 1962	<u>18,283</u>	<u>1,559</u>	<u>9,287</u>	<u>29,134</u>
 Net Change During The Year	- 17	- 8	+ 246	+ 221

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1962-63

CONTRACTUAL SERVICE (P. G. & E. COMPANY)

Company-owned facilities (a)	\$709,178		
Jointly-owned facilities (a)	65,737		
City-owned facilities (b)	197,112		
Emergency service to City-owned facilities	<u>2,144</u>	\$974,171	
Less deduction for energy component		<u>488,769</u>	\$485,402

CONTRACTUAL SERVICE (EMSCO ELECTRIC CORPORATION)

Maintenance of City-owned facilities			
Group replacement of lamps	31,990		
Routine maintenance	<u>11,568</u>	43,558	
Repair of City-owned facilities			
Damages caused by accidents (c)	24,330		
Damages caused by equipment failure	<u>9,947</u>	<u>34,277</u>	77,835

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damages caused by accidents (c)	5,826		
Damages caused by equipment failure	<u>1,074</u>		6,900

ELECTRIC ENERGY (HETCH HETCHY)

36,339,702 kwh @ \$0.01345 less 21 $\frac{1}{2}$ % discount (d)			<u>386,128</u>
---	--	--	----------------

TOTAL EXPENDITURE \$956,265

LESS AMOUNT PAID TO HETCH HETCHY FROM:

Gas Tax Funds for State Highway routes	\$11,649		
Recreation and Park Dept. for off-street lighting	<u>395</u>	<u>12,044</u>	

TOTAL NET EXPENDITURE \$944,221

AVERAGE OPERATING COST

Based on number of lights in service June 30, 1963, average total cost of operation, maintenance and repair per light per year: \$ 32.58

- NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.
- (b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.
- (c) When responsible party is known, claim is filed for recovery of costs. (See Table 13)
- (d) Energy for municipal purposes is furnished at 21 $\frac{1}{2}$ % discount.

2012

1. *Pharmaceuticals* (1998) 10: 1-12.
 2. *Pharmaceuticals* (1999) 11: 1-12.
 3. *Pharmaceuticals* (2000) 12: 1-12.
 4. *Pharmaceuticals* (2001) 13: 1-12.
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 21. *Pharmaceuticals* (2018) 30: 1-12.
 22. *Pharmaceuticals* (2019) 31: 1-12.
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 24. *Pharmaceuticals* (2021) 33: 1-12.
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 26. *Pharmaceuticals* (2023) 35: 1-12.
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 119. *Pharmaceuticals* (2116) 128: 1-12.
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Journal of Management Studies, 19(1), 67-80.

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER

ACCIDENT DAMAGE TO CITY-OWNED STREET LIGHTING
BY FISCAL YEARS

| | <u>1959-60</u> | <u>1960-61</u> | <u>1961-62</u> | <u>1962-63</u> |
|---|----------------|----------------|----------------|----------------|
| Number of Accidents | 53 | 86 | 89 | 85 |
| Cost of Damage Repairs (a) | \$ 24,566 | \$ 30,412 | \$ 25,740 | \$ 35,692 (b) |
| Average Cost Per Accident | 464 | 354 | 289 | 420 (b) |
| Amount Billed Responsible Parties (c) | 23,156 | 21,683 | 32,361 | 27,818 |
| Amount Collected: | | | | |
| By Bureau of Light, Heat and Power | 10,600 | 7,352 | 14,010 | 11,070 |
| By Bureau of Delinquent Revenue (d) (e) | 3,929 | 2,663 | 6,855 | 8,658 |
| Amount Abandoned (Uncollectible) | 3,626 | 3,646 | 8,724 | 4,269 |
| Accounts Receivable June 30: | | | | |
| Payable to Bureau of Light, Heat and Power | 6,036 | 1,803 | 3,553 | 3,982 |
| Payable to Bureau of Delinquent Revenue (e) | 12,478 | 19,706 | 22,240 | 25,605 |

NOTES: (a) Includes administrative expense.

(b) Includes estimated cost of uncompleted work as of June 30, 1963.

(c) Includes only cases of current and previous year for which work was completed during the year.

(d) Includes installment payments on cases from previous years.

(e) Accounts are transferred to Bureau of Delinquent Revenue when:

1. Account is over 90 days old
2. Installment payments are made
3. Liability is denied
4. Responsible party is deceased or his whereabouts unknown

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1962-63

| <u>Location</u> | <u>No. of
Lights</u> | <u>Type of
Light (a)</u> | <u>Source of
Funds (b)</u> | <u>Value</u> |
|--|--------------------------|------------------------------|--------------------------------|-------------------|
| Crestmont Drive - Oakhurst to Devonshire | 4 | I | DPW | \$ 3,955 |
| Grandview Stairs | 3 | I | DPW | 3,955 |
| Ashwood Lane - bet. Warren & Clarendon | 4 | I | DPW | 1,600 |
| Geneva Ave. - San Jose to Tara | 6 | M | DPW | 3,300 |
| Sunglow Lane Stairway | 2 | M | DPW | 1,631 |
| Webster St. - Post to Golden Gate | 27 | M | DPW | 13,000 |
| Scott St. - O'Farrell to Turk | 17 | M | DPW | 15,738 |
| Taylor St. - Bay to Jefferson | 11 | I | DPW | 8,118 |
| Webster St. - Clay to Sacramento &
Hayes St. - Stanyan to Shrader | 16 | M | DPW | 13,500 |
| Twin Peaks Blvd.-St. Germain to Palo Alto | 2 | I | DPW | 1,465 |
| Montgomery & Broadway | 4 | M | DPW | 1,796 |
| Lake Merced Blvd. - Winston to Sunset | 7 | M | DPW | 16,270 |
| Geneva Greens | 31 | M | PO | 21,700 |
| | <hr/> | | | <hr/> |
| TOTAL | <u>134</u> | | | <u>\$ 106,028</u> |

NOTES: (a) I - Incandescent lamps
M - Mercury Vapor lamp

(b) DPW - Department of Public Works
PO - Property Owner

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

[illegible]

TABLE 16
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1962-63

| Contract No. | Description | Contractor | Contract Time | | Original Contract Price | Value of Work Done During Fiscal Year |
|--|--|---|---------------|-----------|-------------------------|---------------------------------------|
| | | | Started | Completed | | |
| HH-341 | Alterations Warnerville Substation & Lines #7 & #8 | Ets-Hokin & Galvin | 4-9-62 | 9-28-62 | \$ 24,999 | \$ 24,999 |
| HH-345 | Penstock Excavation Canyon Powerhouse | A. Turrin & Sons | 10-23-61 | 9-21-62 | 213,875 | 86,166 |
| HH-348 | Air Cooling System O'Shaughnessy Cottage #1 | Hetch Hetchy Project | 7-16-62 | 2-26-63 | 2,970* | 2,970 |
| HH-349 | Canyon Power Tunnel | The Clancy M. O'Dell Construction Company | 1-8-62 | --- | 11,169,895 | 5,354,846 |
| HH-350 | Stream Gaging Stations Tuolumne & Cherry Rivers | Roy Madsen Construction Co. | 10-29-62 | 2-25-63 | 23,799* | 22,848 |
| HH-351 | Relocate Stream Gaging Station-Laird Slough | C. I. Cunningham | 10-15-62 | 11-26-62 | 3,275 | 3,275 |
| HH-353R | Central Lubrication System Cherry Powerhouse | Alemite Co. of Northern California | 7-2-62 | 8-23-62 | 9,563 | 9,563 |
| HH-355 | San Joaquin Pipeline No. 3 Section D-1 | Consolidated Western Steel Corporation | 9-17-62 | --- | 1,447,316 | 1,186,950 |
| HH-356 | San Joaquin Pipeline No. 3 Section D-2 | Consolidated Western Steel Corporation | 9-17-62 | --- | 1,651,147 | 1,403,353 |
| HH-359 | Sawdust Collection System Moccasin Carpenter Shop | Brown Sheet Metal | 10-1-62 | 10-30-62 | 1,300 | 1,300 |
| Total Amount of Hetch Hetchy Contract Construction Work Performed During Fiscal Year | | | | | \$ 8,096,270 | \$ 8,096,270 |

* Includes City-furnished material.

TABLE 17
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1962-63

| Contract No. | Description | Contractor | Contract Time | | Original Contract Price | Value of Work Done During Fiscal Year |
|--------------|---|--|---------------|-----------|-------------------------|---------------------------------------|
| | | | Started | Completed | | |
| A-259 | South Terminal Apron Pavement & Facilities | L. C. Smith Co. | 7-30-62 | --- | \$ 1,600,025 | \$ 1,355,510 |
| A-260 | South Terminal Building and Piers | M & K Corp.-
Stolte Inc. | 9-25-61 | --- | 8,473,000 | 4,431,841 |
| A-285 | Pavement for Extension of Runway 28L | Fay Improvement & Fredrickson & Watson | 4-1-63 | --- | 1,058,016 | 197,079 |
| A-297 | Elevated Roads and Ramps | M & K Corp.-Stolte Inc. | 5-14-62 | --- | 540,851 | 444,452 |
| A-298 | Ground Level Road, So. Term. | Lowrie Paving Co. | 10-15-62 | --- | 181,799 | 136,813 |
| A-299 | Communications Sys., Additions | Bts-Hokin & Galvin | 6-4-62 | 7-3-62 | 1,554 | 1,554 |
| A-307 | Central Terminal Bldg. Baggage Facilities | Les Kelly Corp. | 6-25-62 | 9-22-62 | 72,455 | 72,280 |
| A-309 | Extension of Pier C | Pac. Coast Bldrs. | 11-5-62 | --- | 1,082,100 | 619,055 |
| A-311 | Reconstruct Runway & Taxiway Pavement | L. C. Smith Co. | 9-24-62 | 1-29-63 | 394,665 | 380,683 |
| A-312 | Timber Structure Runway 19L Approach Light System | Duncanson-Harrelson Co. | 12-31-62 | 6-5-63 | 66,450 | 66,450 |
| A-313 | Extension of Road R-2 | Lowrie Paving Co. | 9-2-62 | 11-2-62 | 50,240 | 53,837 |
| A-314 | Relocation of Existing Parking Facilities | Lowrie Paving Co. | 2-18-63 | --- | 100,987 | 94,415 |
| A-316 | Pier C Interim Facilities | Pierce, McAllister & Thorsell, Inc. | 4-9-62 | 7-31-62 | 70,500 | 4,450 |
| A-318 | Taxiway R Extension | Lowrie Paving Co. | 6-11-62 | 7-23-62 | 21,514 | 18,097 |

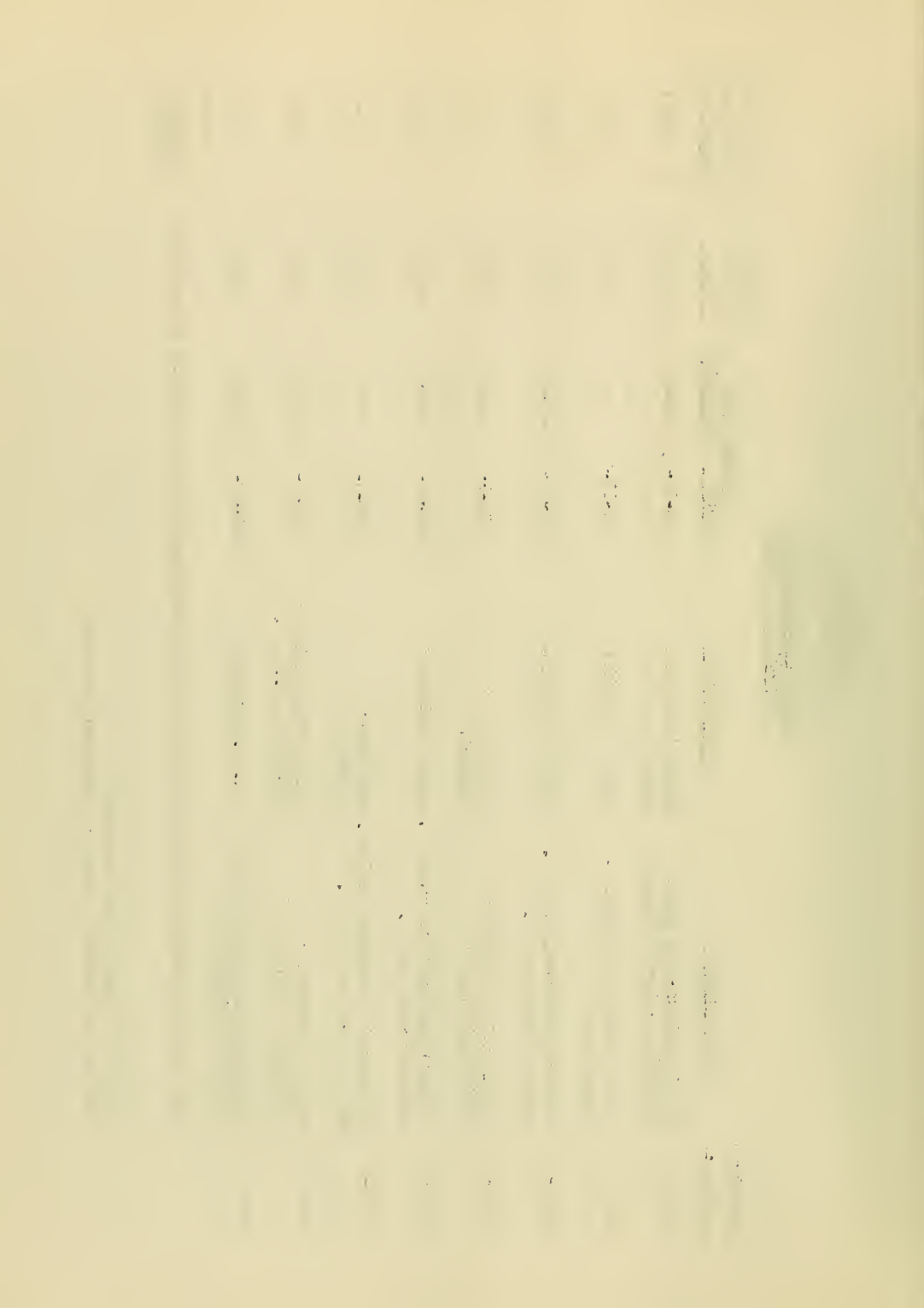
(Cont'd)

TABLE 18
MUNICIPAL RAILWAY

| Contract No. | Description | Contractor | CONSTRUCTION CONTRACTS
FISCAL YEAR 1962-63 | | Original Contract Price | Value of Work Done During Fiscal Year |
|---|--|--------------------------------------|---|-------------------------|-------------------------|---------------------------------------|
| | | | Contract Time Started | Contract Time Completed | | |
| MR-465 | Alterations-Trolley Coach Overhead-Fission & Alemany | Abbett Electric Company | 1-13-63 | 1-29-63 | \$ 11,508* | \$ 6,423 |
| MR-474 | Track Removal and Const. Elkton Yard | Sharp & Fellows | 2-11-63 | --- | 74,662* | 55,056 |
| MR-475 | Track Construction, Temp. Detour - Ocean Ave. | Sharp & Fellows | 11-29-62 | 2-26-63 | 41,637 | 36,265 |
| MR-477 | Relocation of Feeders Elkton Shop Area | West Coast Electric | 10-1-62 | 11-8-62 | 20,488* | 19,973 |
| MR-478 | Overhead Construction, Temp. Detour - Ocean Ave. | Brayer Electric | 12-20-62 | 3-4-63 | 26,671 | 27,688 |
| MR-480 | Relocation of Feeders, Temp. Detour - San Jose Ave. | West Coast Electric | 4-8-63 | * * | 11,920* | --- |
| MR-484 | Soil Pipe Repairs Washington & Mason PH | Western Plumbing & Heating Co., Inc. | 4-8-63 | 4-29-63 | 1,525 | 1,525 |
| MR-485 | Replacement of Water Service Forest Hill Station | D. I. Chadbourne | 4-22-63 | 5-25-63 | 2,777 | 2,719 |
| Total Amount of Municipal Railway Contract Construction Work Performed During Fiscal Year | | | | | | <u>\$ 149,649</u> |

* Includes City-furnished materials

**Subject to Southern Freeway Construction Schedule



HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU
AND
BUREAU OF LIGHT, HEAT AND POWER

ORGANIZATION AND PERSONNEL

O. L. Moore

General Manager

Hetch Hetchy Project

Administration:

B. W. Grethel

Assistant General Manager

Power Production:

R. E. Collins

Senior Electrical Engineer

Water Production:

D. H. Matlock

Senior Mechanical Engineer

Land and Water Resources:

R. Bei

Senior Civil Engineer

Operations:

J. L. Woods

Superintendent of Operations

Accounting:

W. J. Dwyer

Chief Accountant

Utilities Engineering Bureau

Administration:

W. F. Getts

Senior Civil Engineer

Planning:

J. L. Bardoff

Senior Civil Engineer

Civil and Structural Engineering:

R. G. Lee

Senior Civil Engineer

Electrical Engineering:

S. Yakahi

Electrical Engineer

Mechanical Engineering:

B. D. Kong

Associate Mechanical Engineer

Architectural:

S. F. Davis

Senior Architect

Construction:

J. E. Parks

Senior Construction Engineer

Bureau of Light, Heat and Power

Street Lighting and Utility Services:

L. R. Clark

Electrical Engineer

| S F WATER DEPT CITY RESERVOIRS | |
|--------------------------------|-----------------------------|
| NAME | Capacity
Million gallons |
| LAKE MERCED | 2,500.0 |
| SUNSET | 176.0 |
| BALBOA | 150.0 |
| UNIVERSITY MOUND | 140.9 |
| SUTRO | 31.4 |
| SUMMIT | 14.3 |
| COLLEGE HILL | 13.5 |
| STANFORD HEIGHTS | 11.0 |
| MERCED MANOR | 9.5 |
| LOMBARD | 2.7 |
| FRANCISCO | 2.5 |
| POTRERO | 1.0 |
| WILLOE AVE | 0.5 |

• PROPOSED

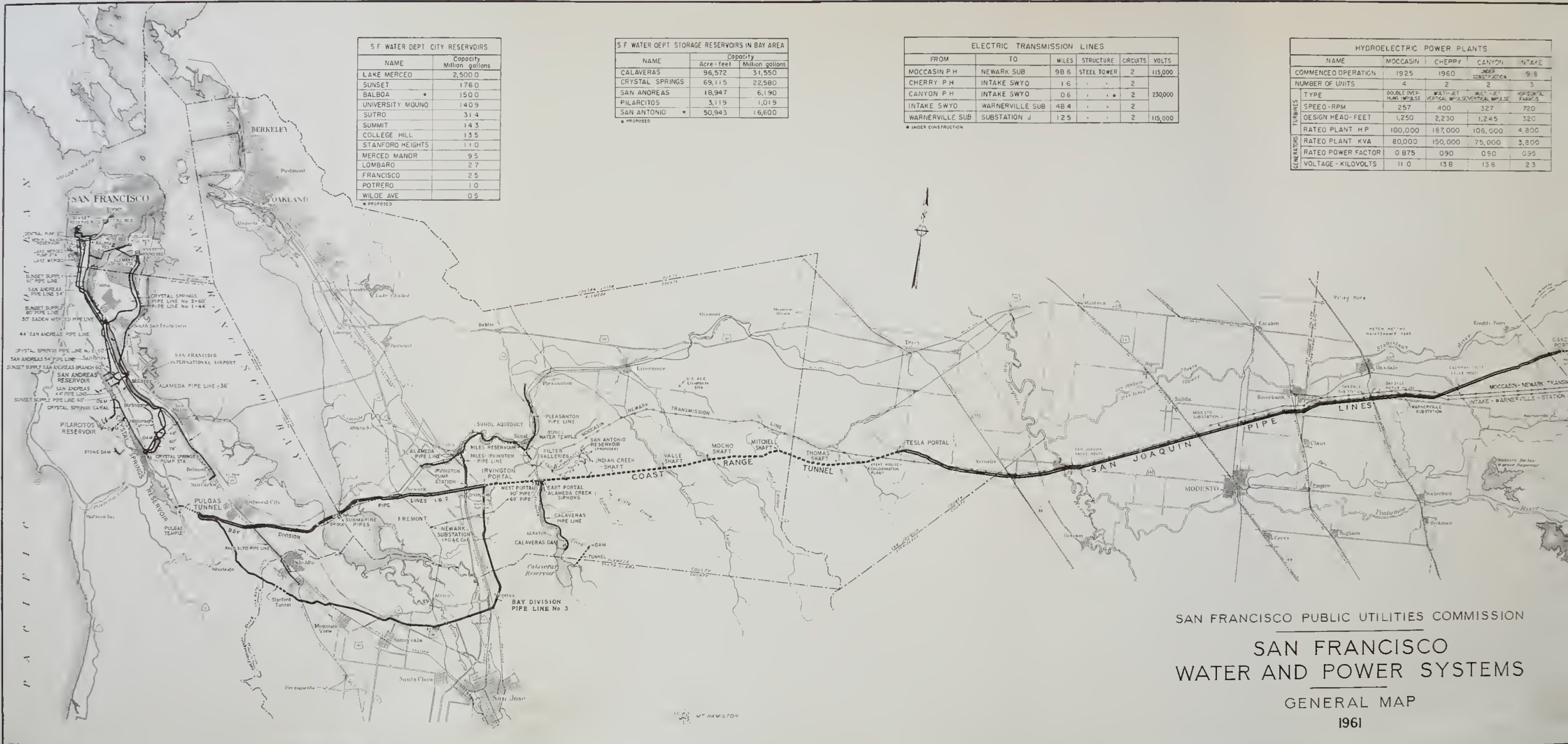
| S F WATER DEPT STORAGE RESERVOIRS IN BAY AREA | | |
|---|-----------|-----------------|
| NAME | Capacity | |
| | Acre-feet | Million gallons |
| CALAVERAS | 96,572 | 31,550 |
| CRYSTAL SPRINGS | 69,115 | 22,580 |
| SAN ANTONIO | 18,947 | 6,190 |
| PILARCITOS | 3,119 | 1,019 |
| SAN ANTONIO | 50,943 | 16,600 |

• PROPOSED

| ELECTRIC TRANSMISSION LINES | | | | | |
|-----------------------------|-----------------|-------|-------------|----------|---------|
| FROM | TO | MILES | STRUCTURE | CIRCUITS | VOLTS |
| MOCCASIN P.H. | NEWARK SUB | 98.6 | STEEL TOWER | 2 | 115,000 |
| CHERRY P.H. | INTAKE SWYO | 1.6 | " | 2 | " |
| CANYON P.H. | INTAKE SWYO | 0.6 | " | 2 | 230,000 |
| INTAKE SWYO | WARNERVILLE SUB | 48.4 | " | 2 | " |
| WARNERVILLE SUB | SUBSTATION J | 12.5 | " | 2 | 115,000 |

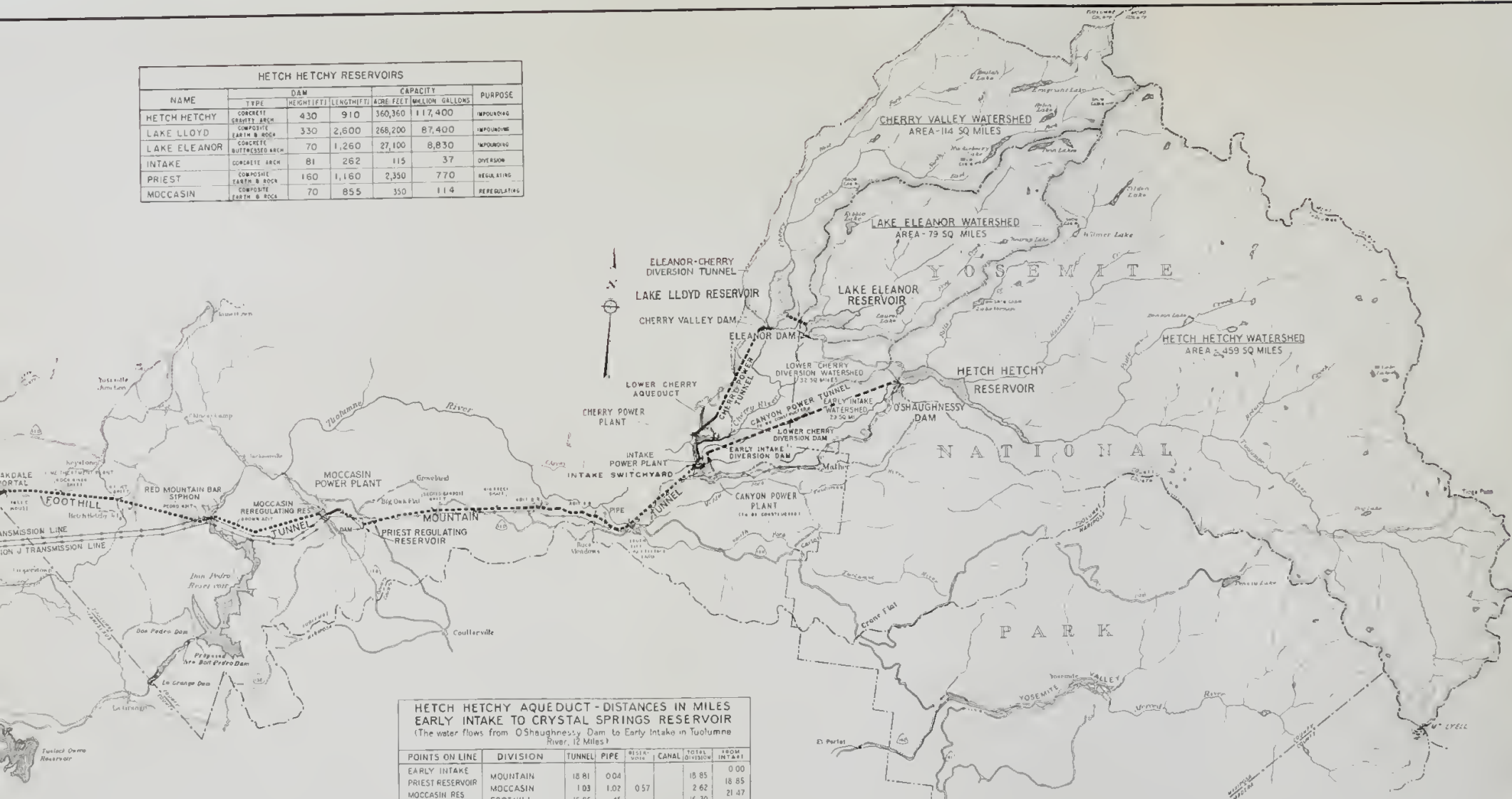
• UNDER CONSTRUCTION

| HYDROELECTRIC POWER PLANTS | | | | |
|----------------------------|-----------------|-----------|-----------|-----------|
| NAME | MOCCASIN | CHEPPY | CANYON | WAKE |
| COMMENCED OPERATION | 1925 | 1960 | 1960 | 1960 |
| NUMBER OF UNITS | 4 | 2 | 2 | 3 |
| TYPE | DOUBLE OVERHUNG | WATER-JET | WATER-JET | WATER-JET |
| SPEED-RPM | 257 | 400 | 327 | 720 |
| DESIGN HEAD- FEET | 1,250 | 2,230 | 1,245 | 320 |
| RATED PLANT H.P. | 100,000 | 187,000 | 106,000 | 4,800 |
| RATED PLANT KVA | 80,000 | 150,000 | 75,000 | 3,800 |
| RATED POWER FACTOR | 0.875 | 0.90 | 0.90 | 0.95 |
| VOLTAGE - KILOVOLTS | 11.0 | 13.8 | 13.8 | 2.3 |



SAN FRANCISCO PUBLIC UTILITIES COMMISSION
 SAN FRANCISCO
 WATER AND POWER SYSTEMS
 GENERAL MAP
 1961

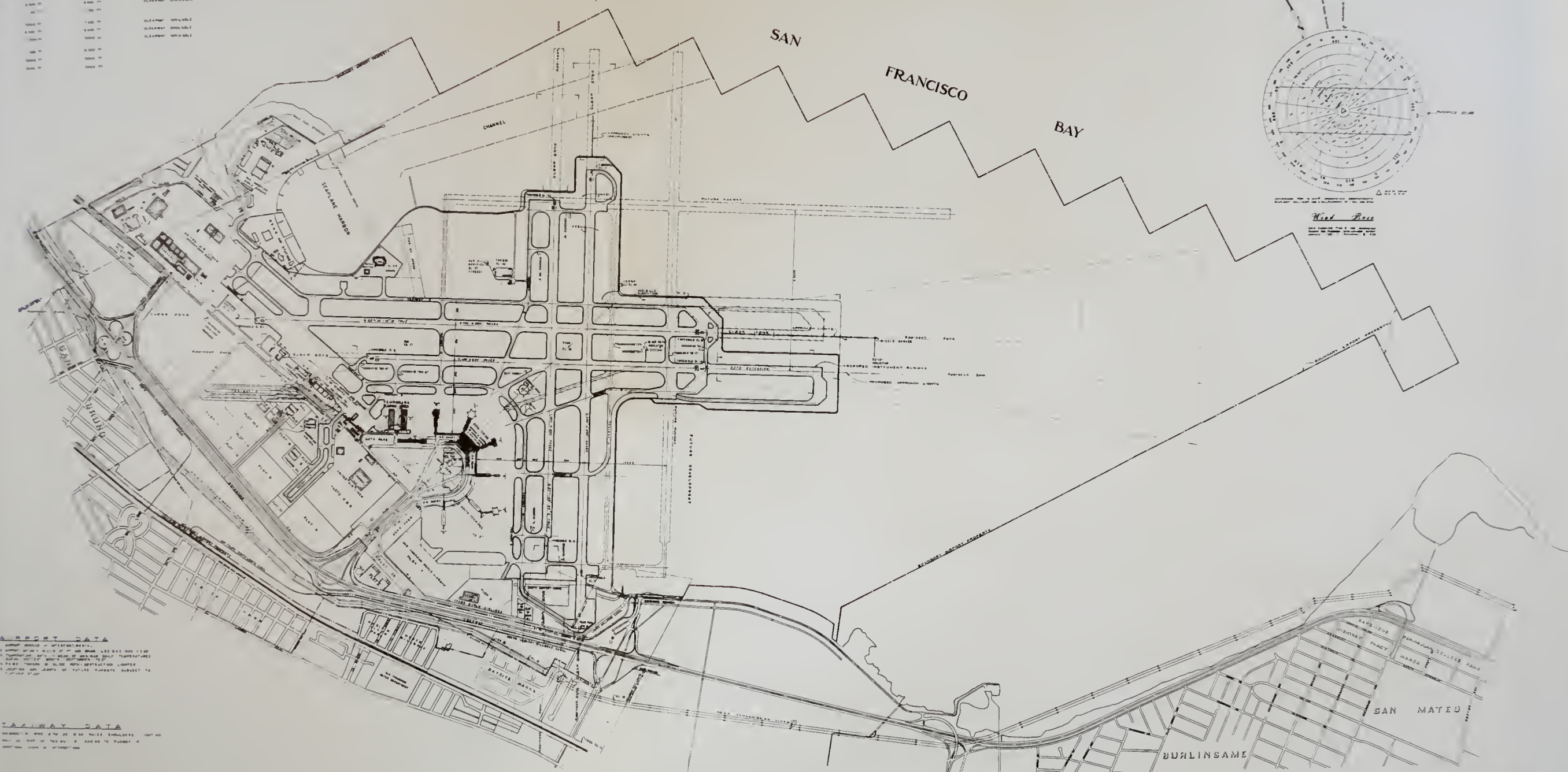
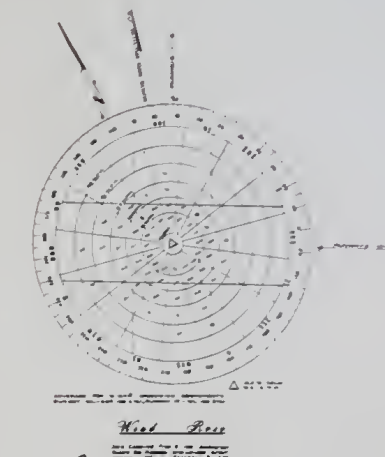
| HETCH HETCHY RESERVOIRS | | | | | | |
|-------------------------|--------------------------|-------------|-------------|-----------|-----------------|------------|
| NAME | DAM | | | CAPACITY | | PURPOSE |
| | TYPE | HEIGHT (FT) | LENGTH (FT) | ACRE FEET | MILLION GALLONS | |
| HETCH HETCHY | CONCRETE GRAVITY ARCH | 430 | 910 | 360,360 | 117,400 | IMPOUNDING |
| LAKE LLOYD | COMPOSITE EARTH & ROCK | 330 | 2,600 | 268,200 | 87,400 | IMPOUNDING |
| LAKE ELEANOR | CONCRETE BUTTRESSED ARCH | 70 | 1,260 | 27,100 | 8,830 | IMPOUNDING |
| INTAKE | CONCRETE ARCH | 81 | 262 | 115 | 37 | DIVERSION |
| PRIEST | COMPOSITE EARTH & ROCK | 160 | 1,160 | 2,350 | 770 | REGULATING |
| MOCCASIN | COMPOSITE EARTH & ROCK | 70 | 855 | 350 | 114 | REGULATING |



HETCH HETCHY AQUEDUCT - DISTANCES IN MILES
EARLY INTAKE TO CRYSTAL SPRINGS RESERVOIR
 (The water flows from O'Shaughnessy Dam to Early Intake in Tuolumne River, 12 Miles)

| POINTS ON LINE | DIVISION | TUNNEL | PIPE | RESERVOIR | CANAL | TOTAL DIVISION | FROM INTAKE |
|---------------------|--------------|--------|-------|-----------|-------|----------------|-------------|
| EARLY INTAKE | | 18.81 | 0.04 | | | 18.85 | 0.00 |
| PRIEST RESERVOIR | FOOTHILL | 1.03 | 1.02 | 0.57 | | 2.62 | 18.85 |
| MOCCASIN RES | FOOTHILL | 15.85 | .45 | | | 16.30 | 21.47 |
| OAKDALE PORTAL | SAN JOAQUIN | 47.51 | | | | 47.51 | 37.77 |
| TESLA PORTAL | COAST RANGE | 28.64 | .59 | | | 29.23 | 85.28 |
| IRVINGTON PORTAL | BAY CROSSING | | 21.24 | | | 21.24 | 114.51 |
| PULGAS E PORTAL | PENINSULAR | 1.71 | | | 0.18 | 1.89 | 135.75 |
| CRYSTAL SPRINGS RES | | | | | | | 137.64 |
| TOTAL | | 66.04 | 70.85 | 0.57 | 0.18 | 137.64 | |



[illegible]

1. $\text{H}_2\text{O} + \text{CO}_2 \rightarrow \text{H}_2\text{CO}_3$
 2. $\text{H}_2\text{CO}_3 \rightleftharpoons \text{H}^+ + \text{HCO}_3^-$
 3. $\text{HCO}_3^- \rightleftharpoons \text{CO}_3^{2-} + \text{H}^+$
 4. $\text{H}_2\text{O} + \text{CO}_2 \rightleftharpoons \text{H}_2\text{CO}_3$
 5. $\text{H}_2\text{CO}_3 \rightleftharpoons \text{H}^+ + \text{HCO}_3^-$
 6. $\text{HCO}_3^- \rightleftharpoons \text{CO}_3^{2-} + \text{H}^+$

ANALYSIS DATA

[illegible][illegible][illegible][illegible][illegible]

MASTER PLAN

Rehman

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

ANNUAL REPORT
FISCAL YEAR 1963-64

HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES
ENGINEERING BUREAU
AND
BUREAU OF LIGHT, HEAT AND POWER

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

ANNUAL REPORT
FISCAL YEAR 1963-64

WATER SUPPLY, POWER AND UTILITIES
ENGINEERING BUREAU
AND
BUREAU OF LIGHT, HEAT AND POWER

O. L. MOORE
GENERAL MANAGER

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CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

HETCH HETCHY WATER SUPPLY
POWER AND UTILITIES ENGINEERING BUREAU
425 MASON STREET
SAN FRANCISCO 1
PHONE PROSPECT 5-7000

August 25, 1964

Subject: ANNUAL REPORT
FISCAL YEAR 1963-64



Mr. James K. Carr
General Manager of Public Utilities
Public Utilities Commission
City and County of San Francisco

Dear Mr. Carr:

The Annual Report for fiscal year ending June 30, 1964, of Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau, and Bureau of Light, Heat and Power is respectfully submitted.

Approximately \$21 million in funds appropriated this fiscal year were administered for Department activities covering operation, maintenance, engineering, and construction. This amount is in addition to previously appropriated funds for construction under way or completed during the year.

Fiscal year 1963-64 marked the 50th anniversary of the Hetch Hetchy grant, known as the Raker Act. This act, passed by Congress in 1913, grants to the City rights-of-way and use of public lands for development and operation of its water and power system in the Sierra Nevada.

Hetch Hetchy Project revenue from sale of water and power was \$15,346,269 compared to total expenditures of \$13,721,793, which included bond interest and redemption. Revenue in excess of expenditures was \$1,624,476 compared to budget estimate of \$359,522, thus reflecting a very satisfactory operating year. The principal reason for this was the large carry-over storage from the previous favorable water year which permitted electric generation at near maximum capability.

Engineering and construction for Hetch Hetchy Project, San Francisco International Airport, and Municipal Railway continued at a high rate. During the year, \$18 million in construction contracts were awarded. At year's end, plans and specifications for an additional \$8.6 million of work were being prepared. Total value of construction work performed during the year was \$24.4 million with \$23 million under current contracts remaining to be done.

On the Hetch Hetchy Project, the \$11 million Canyon Power Tunnel, a major element of the Canyon Power Development, was "holed-through" and nearing completion. The first section, 11 miles in length, of the third aqueduct pipeline across the San Joaquin Valley, was placed in service, increasing the aqueduct capacity from 160 to 173 million gallons per day. An additional 23 miles of this line, now under construction, will be in service early in 1965, providing further increase in capacity to 215 million gallons daily. Preliminary studies and a project planning report were completed for replacement of Moccasin Powerhouse which has been in operation since 1925.

At San Francisco International Airport, improvements to meet increasing demands of jet-age traffic continued unabated. Construction was completed on the \$11 million South Terminal building and associated piers. The first stage of the four-level parking structure, with initial capacity of 2,850 automobiles, is rapidly taking shape in the terminal complex center. Runway 28L was extended to a total paved length of 9,500 feet. Pier C gained a new look and increased efficiency upon completion of a hexagonal shaped, three-story addition. Moving sidewalks, the first of their kind at a major airport, were built into the concourse connecting Piers B and C. Numerous other significant improvements in the field and terminal areas were completed.

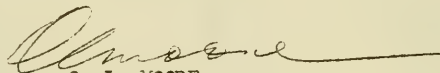
Municipal Railway facilities including track, overhead trolley wires and feeders, were modified to accommodate the State in construction of the Southern Freeway. Work was in progress on replacement of radio equipment at the communications center on Twin Peaks and in mobile stations. Studies continued on the improvement of Municipal Railway operation and the effect the Bay Area rapid transit system will have on Railway plant and future operations.

A program for modernization of street lighting in overhead districts was inaugurated. Approximately 13,200 obsolete incandescent lights will be replaced with 15,000 mercury vapor units having double the light output, over a three-year period. Expenditures for operation, maintenance, and repair of the street lighting system were \$985,934, an average of \$32.41 per unit. As of June 30, 1964, there were 30,556 street lights in service, an increase of 1,201 for the year.

We express our grateful appreciation to all Department employees for their loyalty and diligence in making possible the accomplishments recorded in this report.

The year was marked with sadness by the passing of Robert C. Kirkwood, Manager of Utilities of the Public Utilities Commission, and James E. Parks, Senior Construction Engineer of the Utilities Engineering Bureau. The loss of these dedicated workers is sincerely felt by management, fellow employees, and associates outside City government. Their memory will be long cherished by all of us.

Very truly yours,

A handwritten signature in dark ink, appearing to read "O. L. Moore", with a long, sweeping horizontal line extending to the right.

O. L. MOORE
General Manager

ANNUAL REPORT

I. ORGANIZATION AND RESPONSIBILITIES

HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU and BUREAU OF LIGHT, HEAT AND POWER, as a single unit under its General Manager, serves the City and County of San Francisco in the dual function of an operating department and a service bureau. Its policies are established by the San Francisco Public Utilities Commission and administered under the direction of the General Manager of Public Utilities.

Hetch Hetchy Water Supply and Power System, an operating unit, commonly known as Hetch Hetchy, encompasses a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed in California's Sierra Nevada and delivers to the San Francisco Water Department. Most of the water supplied in San Francisco and the Water Department service area comes from this source. Hetch Hetchy also operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy as a by-product of its major function.

The Utilities Engineering Bureau provides engineering services for Hetch Hetchy, San Francisco International Airport, and San Francisco Municipal Railway and is responsible for the design and construction of all improvements for these utilities

The Bureau of Light, Heat and Power is a service bureau. It arranges, under contracts, for furnishing electric, gas, and steam services to municipal departments and handles the monthly billing. It also supervises planning and improvements of street lighting furnished by the Pacific Gas and Electric Company and administers contracts for street lighting operation and maintenance. Financing, design, and construction of City-owned street lighting improvements are under jurisdiction of Department of Public Works. Plans for these improvements must be approved by Public Utilities Commission through this Bureau.

For fiscal year 1963-64, the Department administered budgeted funds for operation, maintenance, engineering, and construction as follows:

| <u>Budget</u> | <u>No. of Employees</u> | <u>Total Amount
Appropriated</u> |
|---------------------------------------|-------------------------|--------------------------------------|
| Hetch Hetchy Project | 116 | \$13,933,878 |
| Utilities Engineering Bureau | 161 | 1,668,015 |
| Bureau of Light, Heat and Power | 12 | 5,223,683 |
| 1955 Hetch Hetchy Power Bond Fund | -- | 496,296 * |
| 1956 Airport Bond Fund | -- | 281,241 * |
| 1961 Municipal Water System Bond Fund | -- | 716,738 * |
| 1962 Airport Bond Fund | -- | 157,461 * |
| | | <hr/> |
| | | \$22,477,312 |
| Less budget transfer duplications | | 1,360,735 |
| | | <hr/> |
| TOTAL | 289 | \$21,116,577 |

* Does not include funds previously appropriated for construction under way or completed during fiscal year 1963-64.

II. HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

Hetch Hetchy Grant

Fiscal year 1963-64 marked the 50th anniversary of the Hetch Hetchy grant, known as the Raker Act, which was passed by Congress and signed by President Woodrow Wilson on December 19, 1913.

The Raker Act grants to the City rights-of-way and use of lands in Yosemite National Park, Stanislaus National Forest, and other Federally-owned areas for constructing, maintaining, and operating reservoirs, dams, conduits and other structures necessary or incidental to the development and use of water and power.

Description of Project

Hetch Hetchy, a water supply project, utilizes the precipitation and runoff of the upper Tuolumne River watershed, on the westerly slope of the Sierra Nevada, some 150 miles east of San Francisco Bay. This supply supplements local sources in San Mateo, southern Alameda, and northern Santa Clara counties for domestic and industrial use within the City of San Francisco and its suburban area.

Electric energy generated from falling water is conveyed to San Francisco over transmission lines of the City and of the Pacific Gas and Electric Company under a wheeling agreement. This power source supplies municipal needs including water supply pumping stations, municipal airport, street transit system, street lighting, public building lighting, and miscellaneous other loads. Electric energy is also furnished to two irrigation districts in the San Joaquin Valley to supplement generation of their own plants and, through facilities of Pacific Gas and Electric Company, to five industrial customers, two located in Santa Clara County, and three in Contra Costa County. Load requirements in excess of the City's Hetch Hetchy generation are supplied by power and energy purchased from Pacific Gas and Electric Company.

Hetch Hetchy Project is self-supported by revenue from electric power sales and from wholesale delivery of water to the San Francisco Water Department. In turn, the Water Department transmits and distributes the water for sale to customers.

Operating properties of Hetch Hetchy water supply and power system are located in Tuolumne, Stanislaus, San Joaquin, and Alameda Counties. The water supply facilities include: eight dams with appurtenant impounding and regulating reservoirs and diversion works; 67 miles of tunnels; and 106 miles of aqueduct pipelines. The power system facilities include: three powerhouses, Moccasin-70,000 kilowatts, Cherry-135,000 kilowatts, and Intake-3,600 kilowatts (standby); 190 miles of high voltage transmission lines; substations and switchyards. The facilities also include electric distribution, telephone and radio communication systems for project use.

The power system is being expanded by construction of the second stage of the Canyon-Cherry Power Development financed from the 1955 Hetch Hetchy Power Bonds in the amount of \$54 million. The first stage, completed and placed in service in August, 1960, included Cherry Power Tunnel and Powerhouse, Intake Switchyard, Warnerville Substation, and the associated transmission system. The second stage,

[illegible]

presently under construction, includes Canyon Power Tunnel, Canyon Powerhouse and appurtenant facilities. This will complete the power system expansion program authorized under the 1955 bond issue.

A map showing Hetch Hetchy water supply and power system, together with San Francisco Water Department system, is included in the Appendix.

Revenue and Expenditures

Revenue from Hetch Hetchy Project operation is derived principally from two sources:

1. Wholesale delivery of water to San Francisco Water Department.
2. Sale of electric power and energy to San Francisco municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and five industrial customers---Permanente Cement Company's plant and Kaiser Aluminum & Chemical Corporation's aluminum foil plant, in Santa Clara County, and Chemical plants of Dow Chemical Company, Hercules Powder Company, and Shell Chemical Company in Contra Costa County.

Revenue from sale of water and for standby service to the San Francisco Water Department was \$4,500,000. Gross sales of electric energy amounted to \$10,794,462, compared to \$8,930,781 during the year 1962-63, an increase of 12.1 percent. Approximately 60 percent of this increase was derived from two chemical customers, Hercules Powder Company and Shell Chemical Company. The Hercules increase resulted from sales for a full year compared to two months for the previous year. Shell Chemical became a new customer on February 1, 1964.

Electric power revenue received from Modesto and Turlock Irrigation Districts also increased, resulting from continued electric load growth in the area served by the Districts in San Joaquin Valley. Revenue from City departments for electricity reflected a 7.8 percent growth in consumption for all City departments as a whole, and 19.8 percent for the San Francisco International Airport in particular. Hetch Hetchy power for municipal purposes is furnished to City departments at cost. During the year, this represented a saving to the City of \$687,465 compared to the cost if supplied by the local power utility.

Revenue from service orders, rentals, meals and miscellaneous items was \$51,807.

During the year, \$833,313 was expended for purchase of electric energy for resale, compared to \$226,974 in 1962-63. The increase was due to: (1) Generation based on normal water conditions, compared to above-normal conditions the previous year; (2) Partial shutdown at Cherry Powerhouse in November, 1963, and in May, 1964, because of generating equipment failures; and (3) Increase in sales to the chemical customers.

Service charge for transmission and distribution of Hetch Hetchy power over facilities of Pacific Gas and Electric Company exceeded the budget appropriation by \$147,296. This was due to the addition of the Hercules Powder and Shell Chemical loads which was not anticipated in budget estimates. The deficiency, covered by a transfer of funds, was more than offset by the resulting increase in gross revenue.

Interest and redemption costs on outstanding Hetch Hetchy bonds for the year was \$8,448,734.

In March, 1964, the City received a refund from Pacific Gas and Electric Company in the amount of \$14,724. This was computed at the rate of \$0.000329 per kilowatt-hour for 44,753,470 kilowatthours of supplemental energy purchased in 1963 for resale to Dow Chemical Company. The refund was the result of decisions by California Public Utilities Commission, directing P.G.& E. to pass on to its customers the refunds and rate reductions received from settlement of rate proceedings of El Paso Natural Gas Company before the Federal Power Commission. In accordance with the assignment contract between City, Pacific Gas and Electric Company, and Dow Chemical Company, the refund was passed on to the chemical company.

Tables 1, 2 and 6 show comparative data on receipts, expenditures, and sales of water and power in operation of Hetch Hetchy water supply and power system.

Taxes

Taxes for 1963-64 on utility properties under jurisdiction of Hetch Hetchy Project, located outside the City and County of San Francisco, were paid in the following amounts:

| <u>Tax-Levying Body</u> | <u>Assessed Value</u> | <u>Taxes Paid</u> |
|-------------------------------------|-----------------------|-------------------|
| Alameda County | \$ 1,600 | \$ 130.36 |
| San Joaquin County | 25,825 | 1,840.82 |
| San Mateo County | 1,330 | 118.36 |
| Stanislaus County | 54,270 | 4,271.16 |
| Tuolumne County | 3,421,150 (a) | 202,845.08 |
| Banta-Carbona Irrigation District | 3,192 | 137.26 |
| Modesto Irrigation District | 13,600 | 0.00 (b) |
| Oakdale Irrigation District | 12,320 | 862.40 |
| West Stanislaus Irrigation District | 1,800 | 99.00 |
| City of Redwood City | 2,980 | 56.10 |
| TOTAL | | \$210,360.54 |

(a) Includes \$3,000,000 assessment for water rights.

(b) Tax rate for fiscal year 1963-64 set at \$0.00.

Water Production and Transmission

After two normal years, 1963-64 started as an excellent water year when above-average precipitation occurred in November. However, there followed two months of low rainfall. Late January storms raised the record almost to normal for that time of year. February was extremely dry with only two percent of normal precipitation. Conditions improved during March and April but the net result for the year was considerably below normal and the total runoff into the City's mountain reservoirs was 71 percent of normal. In spite of carry-over storage from the previous year, storage conditions at year's end were only fair.

Because of subnormal runoff, it was not necessary to release water from any of the reservoirs under agreement with the Corps of Engineers, U. S. Army, for flood control.

During the year, 43,184,700,000 gallons of water were diverted by the City from Tuolumne River watershed through Hetch Hetchy Aqueduct for delivery to San Francisco Water Department. In addition, 135,990,000 gallons were delivered to United States Atomic Energy Commission at Ilocho Shaft of the Coast Range Tunnel for use at Lawrence Radiation Laboratory at Livermore.

For the second consecutive year, the Department used a helicopter to transport personnel to higher elevations for conducting snow surveys.

Table 3 shows comparative data on precipitation, runoff, storage and deliveries of the Hetch Hetchy water supply system.

Power System Operation

As a result of favorable runoff during the spring of 1963, power operation for the fiscal year began with full capacity storage in all of City's mountain reservoirs. Moccasin Powerhouse was operated at full production and Cherry Powerhouse operation was scheduled to utilize water estimated to be available during a normal water year. Under this program, storage in Lake Lloyd was down to approximately 60,000 acre-feet at the beginning of 1964 spring runoff.

Due to subnormal runoff, Hetch Hetchy Reservoir was not full on June 30, 1964, but generation to capacity will be possible at Moccasin Powerhouse during the coming fall and winter. However, storage in Lake Lloyd and Lake Eleanor was only 45 percent of capacity and some curtailment of power generation at Cherry Powerhouse will be necessary during the next fiscal year.

Following a review of system load requirements and Hetch Hetchy generation capability, assignment to the City of electric service contract between Pacific Gas and Electric Company and Shell Chemical Company was made effective February 1, 1964. This permitted complete utilization of available generating capacity.

On November 2, 1963, as a result of insulation failure, the 13,800-volt stator winding of Generator No. 1 in Cherry Powerhouse caught fire. The unit was automatically shut down by protective relays. However, the damage required replacement of 19 stator coils, one finger plate, terminal lead block, and some core iron. Repair work was performed by armature winders of Allis-Chalmers Company, the generator manufacturer, together with City forces, at a cost of \$75,673. The unit was returned to service on November 30.

On June 9, 1964, as a result of a flashover at the exciter commutator, Generator No. 2 at Cherry Powerhouse was shut down for replacement of damaged exciter armature, associated brush holders, and the voltage regulator motor-generator set. The unit was returned to service on June 12.

Tables 4 to 7, inclusive, show comparative operating statistics for Hetch Hetchy power system.

Improvements To Operating Properties

During the year, a recording precipitation gauge was installed at Lake Lloyd. This gauge will provide a continuous graphic record of precipitation which is required for runoff predictions and flood control operations. Frequently during the winter, Lake Lloyd is inaccessible for observations by personnel due to storms and snow.

Alterations and repairs to the foundation and interior of the operator's cottage at Tesla chlorinating plant, located at the easterly portal of the Coast Range Tunnel, were completed.

To comply with new "narrow band" technical standards of Federal Communications Commission, most of the mobile radio communication system equipment was replaced. This included three base stations at Moccasin, Early Intake and O'Shaughnessy Dam, and thirty mobile stations, all operating on a new frequency of 48.20 megacycles. Equipment at the five snow survey cabins will be replaced when the areas become accessible during the summer of 1964.

Approximately 800 vibration dampers were replaced on the 115,000-volt, 100-mile transmission line between Moccasin and Newark. This was part of the fourth stage of a long range program of replacing dampers, originally installed in 1931, which are damaging conductors because they can no longer be kept tight.

A front-end wheel aligner for checking and correcting front end misalignment of automotive equipment was installed in the Moccasin Automotive Shop.

A 15-ton truck crane mounted on a 6-wheel drive carrier complete with a 110-foot boom, a 5/8 cubic yard dragline bucket, and a 5/8 cubic yard hoe was purchased. This equipment will facilitate clearing slides from roads and canals, clearing debris from flood damage, lifting heavy electrical equipment in switchyards, and miscellaneous repair work.

Major maintenance work at Cherry Powerhouse included reconditioning a turbine wheel, turbine needle tips and nozzle seats, and turbine shutoff valve seat rings.

Miscellaneous improvements included construction of steel guard rail to protect five high voltage transmission line towers adjacent to heavily traveled roads, and installation of baseboard heaters in the breakfast rooms of five Moccasin employee cottages which were built in 1925.

Work on reconditioning and painting of 31 steel towers on the Moccasin-Newark transmission line was in progress at the end of the year.

Moccasin Powerhouse

After 39 years' operation of Moccasin Powerhouse, deterioration of turbine runners and structural concrete, low overall efficiency of turbines, and high operating and maintenance costs make it imperative that corrective action be taken. The deteriorated turbines particularly, are a constant hazard to plant operation.

A project planning report, prepared by a firm of consulting engineers, evaluating alternate methods of plant renewal, recommended construction of a new plant

adjacent to the present powerhouse, utilizing the existing penstocks, as most economical. The capacity of the plant will be increased from the present four 17,500-kw units to two 45,000-kw units. The total estimated cost of the new plant is \$8,830,000.

Funds appropriated in the 1964-65 fiscal year budget will cover the first stage of the work. This includes preliminary and design engineering and calling of bids for major items of equipment (turbines, governors, generators, etc.) which require considerable time for delivery. Completion is scheduled for the latter part of 1967.

Canyon Power Project

In November, 1955, the electorate of San Francisco approved a \$54 million bond issue authorizing expansion of the Hetch Hetchy power system by construction of two hydroelectric power plants. The first plant, Cherry Powerhouse, began operation on August 1, 1960.

The second plant, Canyon Powerhouse, will develop the power drop between O'Shaughnessy Dam and Early Intake Diversion Dam. At present, water released from O'Shaughnessy Dam flows down the natural stream bed of Tuolumne River to Early Intake, where it is diverted through 19 miles of tunnel to Hoccasin Powerhouse. By constructing a new pressure tunnel between O'Shaughnessy Dam and Early Intake, a power drop of approximately 1,370 feet can be realized. The total nameplate capacity of the two generators in this powerhouse will be 67,500 kilowatts. After passing through Canyon Powerhouse, the water will bypass Early Intake Diversion Dam through a tunnel and conduit directly into the Mountain Tunnel. This arrangement will eliminate the possibility of water for San Francisco's domestic supply being contaminated from the watershed below O'Shaughnessy Dam as recreational activities increase in the area.

A small auxiliary power plant will be constructed in the existing diversion tunnel at O'Shaughnessy Dam. This plant will be unattended and will have a single 1,200-kilowatt generator which will utilize water released into Tuolumne River at the dam for sport fishery and recreation.

At the end of the fiscal year, work on the first major portion of the Canyon Project, the 10.5-mile power tunnel, was nearing completion. On June 24, 1964, the tunnel was "holed-through" between the downstream heading of Hetch Hetchy Adit and the upstream heading of North Mountain Adit, at a point approximately six miles from the latter. This six miles set a record in the west for tunneling through solid granite in one heading.

The tunnel will be unlined, except where concrete lining is required due to ground conditions, and where steel lining is needed to resist internal pressure adjacent to upstream and downstream portals. The unlined section will be a 14-foot by 14.5-foot horseshoe. At the upstream portal, the tunnel connects to three existing discharge outlets in O'Shaughnessy Dam through a trifurcation and a 9-foot diameter steel conduit which is installed in the existing diversion tunnel and crosses under the Tuolumne River in concrete encasement.

A surge shaft with demand and rejection galleries rises almost 400 feet from the tunnel near the downstream portal. Their purpose is to reduce surges and water hammer caused by sudden changes in loads on the powerhouse turbines when in operation. A trap near the lower end of the tunnel will catch any rock, sand, and debris carried along the tunnel.

The contract for furnishing impulse turbines and related equipment for Canyon Powerhouse was advertised twice before June 30, 1963. The two bids received in the first call were both rejected due to technical deficiencies. Following readvertising, award was made to the low bidder, Pelton Division of Baldwin-Lima-Hamilton Corporation. However, the second bidder, Allis-Chalmers Manufacturing Company, filed suit to prevent certification, alleging that the low bidder's proposal did not comply with specifications because it included furnishing foreign-made parts. The Superior Court finally ruled that all bids must be rejected. Following a third call for bids under revised specifications, award was made to the low bidder, Hitachi, New York, Ltd., for furnishing turbines and related equipment, to be manufactured in Japan.

After procurement of the turbines was resolved, bids were called for furnishing and installing the synchronous generators and related equipment for Canyon Powerhouse. Award was made to the low bidder, Ets-Hokin Corporation of San Francisco, for generators to be supplied by Tokyo Shibura Electric Company (Toshiba) of Japan.

At year's end, final plans and specifications for construction of Canyon Powerhouse, penstock, and bypass tunnel were nearing completion. The plant is scheduled to be in service by mid-summer of 1966.

San Joaquin Pipeline No. 3

Water from Hetch Hetchy Reservoir is brought across San Joaquin Valley to San Francisco Bay Area in two parallel pipelines, each 47.5 miles long. They extend from Oakdale Portal of the Foothill Tunnel in Stanislaus County, to Tesla Portal of the Coast Range Tunnel in San Joaquin County. These two lines have been operating at full capacity of 160 million gallons daily most of the time during the last five years.

A third pipeline, within the same right-of-way, was laid in trenches across the San Joaquin Valley under earth, water, railroad and highway. By the end of the year, over thirty miles of the planned 47.5 miles of pipe had been installed under four contracts. The total estimated cost of \$22 million for this third line is being financed by the 1961 Municipal Water System Bonds. When completed, this additional line will increase Hetch Hetchy Aqueduct capacity to approximately 295 million gallons per day.

On January 13, 1964, Section D of the pipeline, between San Joaquin River and Tesla Portal, was placed in service by temporarily cross-connecting to No. 2 line west of the river and permanently connecting to Tesla manifold. This section included installation of 11 miles of 79-1/2-inch inside diameter, coal-tar enamel lined and coated steel pipe; construction of a new valve house at Tesla Portal; and alterations to the existing chlorinating facilities at the portal. Section D increased aqueduct capacity from 160 to 173 million gallons daily.

Section B, extending 21-1/2 miles between the meter house at Albers Road south of Oakdale and the east levee of San Joaquin River, consists of 78-inch inside diameter, coal-tar enamel coated steel pipe with in-place cement-mortar lining. At year's end, this section was 75 percent complete with 19 miles of pipe in place, of which four miles had been lined.

Section C, crossing under San Joaquin River and connecting Sections B and D, consists of approximately one mile of 78-inch inside diameter, cement-mortar lined steel pipe with reinforced concrete jacket. This pipe will be laid under the river bed on concrete saddles supported by timber piles. The river crossing is being constructed by use of a steel sheet piling cofferdam which will permit the installation in two stages. At year's end, work on Section C was 50 percent complete.

A contract was awarded for the installation of a 30-inch pressure relief valve at San Joaquin Valve House; a Venturi meter at Oakdale Meter House; construction of a cross-connection between Pipelines No. 1, 2 and 3 east of Albers Road near Oakdale; and various short closure lengths to connect sections of the No. 3 line which are completed or under construction. When this work is finished in the spring of 1965, San Joaquin Pipeline No. 3 will be continuous and operable for approximately 34 miles between Oakdale and Tesla Portal, and will increase the aqueduct capacity to approximately 215 million gallons per day.

The State of California proposes to build four freeways which will cross over the San Joaquin Aqueduct. Agreements covering these crossings were reached during the year. Plans for one of the crossings were well advanced, covering encasement of the pipelines under U. S. 99 Freeway, north of Modesto. Also under study by the Department, are plans for crossing of the pipelines by the proposed California Aqueduct, at a point seven miles south of Tracy.

New Don Pedro Dam

On a cooperative basis, the City of San Francisco, Turlock and Modesto Irrigation Districts, and Corps of Engineers, U. S. Army, have agreed to further develop the Tuolumne River watershed by providing additional storage capacity. This is to be accomplished by the Districts' construction of a new dam about one and one-half miles downstream from their present Don Pedro Dam. The City's participation in this project was authorized by electorate approval of the 1961 Municipal Water System Bond Issue.

The new dam will be earth and rock fill with concrete spillways, approximately 580 feet high and 800 feet long with a storage capacity of 2,030,000 acre-feet, seven times that of the present reservoir. The dam will provide necessary increase in storage space for the City and will also provide additional storage space for irrigation and power generation for the Irrigation Districts. Further, it will augment flood control space for the Corps of Engineers in its program for protection of the lower Tuolumne River from flood damage. The increase in storage capacity will enable San Francisco to meet the estimated water requirements of the City and its service area until the year 2015.

The two Irrigation Districts will furnish the damsite and the lands which will be covered by the new reservoir. The City of San Francisco and the Federal Government propose to pay an estimated \$42 million and \$5.4 million respectively toward the cost of the dam.

A hearing on the Turlock and Modesto Irrigation Districts' application for a license to construct and operate the New Don Pedro Project was held by the Federal Power Commission in San Francisco in October, 1962. On June 4, 1963, the examiner who conducted the hearing for the Federal Power Commission filed an initial decision which recommended issuance of a 50-year license to the Districts for the proposed Project. Exceptions to the initial decision were filed by the Districts, the California Department of Fish and Game, the U. S. Department of the Interior and the Federal Power Commission staff.

After thorough study and review of all evidence presented, on March 10, 1964, the FPC distributed its opinion and order issuing a license for the Project. Essentially, the license was for a 50-year period but in the matter of water releases for fish life, over which there had been much controversy, the FPC required a release schedule only for the first 20 years of Project operation. The order stated that during this period studies were to be conducted by all parties involved to determine the needs for fish releases. At the end of this period FPC would determine whether the releases should be continued, curtailed or eliminated.

Following issuance of the order, all parties filed applications for rehearing. On May 6, 1964, FPC denied the applications but did clarify its position that fish releases were not to interfere with the primary purposes of the Project. Districts were then allowed 60 days in which to accept the license.

On July 3, 1964, the State of California, acting on behalf of the Department of Fish and Game, filed a suit in Federal court, petitioning the court to require FPC to review its order and to receive additional evidence.

On July 6, 1964, Department of Interior filed a similar action in the same court. Anticipating such moves, the Districts had prepared action to protect their interests and also filed suit on July 6, in the same court. It appears that these actions will further delay commencement of the New Don Pedro Project.

Status of Hetch Hetchy Construction Contracts

A summary of Hetch Hetchy construction contracts in progress during fiscal year 1963-64 is shown in Table 16.

III. AIRPORT ENGINEERING AND CONSTRUCTION

General

At San Francisco International Airport, improvements to meet the demands of increasing jet-age traffic continued unabated during the fiscal year. The terminal complex involved the major share of expansion with completion of the new South Terminal building highlighting the year's construction activities. In the center of the complex, a vast hole in the ground was rapidly taking shape into a recognizable four-level parking structure. Pier C was capped with a hexagon shaped addition. Moving sidewalks, the first of their kind at a major airport, were installed to serve Pier B. Concurrent with terminal growth, the landing field of Runway 28L was expanded by almost 2,400 lineal feet of pavement. These and other facilities were planned, designed, and constructed with funds from the \$25 million Airport bond issue of 1956, the \$9.8 million Airport bond issue of 1962, and Airport operating revenues.

A map showing the plan of San Francisco International Airport is included in the Appendix.

Construction Progress

The South Terminal building and Piers F and G were opened to the public in September, 1963. The event ushered in the "New Era Airport," with the capability of handling up to 12,000,000 passengers annually. Less spectacular but equally important facilities necessary to make the terminal operational, were constructed concurrently. These included aircraft apron pavement and servicing facilities, service parking areas, an elevated road connecting the South and Central Terminal buildings at the second level, a realigned ground level road network, and utilities.

The first stage of the four-level parking garage, in the heart of the terminal complex, was almost 50 percent complete at the end of the year. The structure covers such an extensive area that construction work has been proceeding on all levels, advancing from south to north in the manner of a wave front. Piles were being driven in one area while the third level was started in another. The garage, which was started in July, 1963, will house about 2,850 automobiles in this first of three stages. Ultimate capacity will be 8,000 automobiles.

During the fiscal year, other significant features were added to the terminal complex. Notable among these were the two parallel moving sidewalks built into the concourse connecting Piers B and C. The 460-foot moving belts were put into operation on a rental basis in May, 1964, for an experimental period of up to twelve months. In the interim, if the facility proves satisfactory, the City will purchase it. Should the City decide not to buy, the manufacturer will remove the walks and restore the building to its original condition.

Pier C gained a new look, more space, and increased efficiency upon completion of a hexagon shaped, three-story addition, roughly similar to that of Pier B. In order to meet the increased electrical load, a 500-kva transformer and additional switchgear were installed. Room G-20 in the stem of the pier was finished.

At Gate 57 in Pier F, a new airline waiting room was added. A covered ramp and gatormoon facilities parallel to future Pier FF were completed to temporarily serve aircraft loading positions until that pier is constructed.

An elevator was installed at Pier G to serve the upper and lower levels of the foreign arrivals quarantine corridor. Also constructed were stairways for two gaterooms in the pier.

A public address system, an automatic flight announcer console, and directional signs were installed in the South Terminal building. Also, improvements were made in the baggage claim area.

The exterior of the Central Terminal building was repainted. Washing and fueling facilities for the care of shuttle buses during garage construction were completed, and waiting shelters for these buses were installed in four locations. For better public guidance to the two terminal buildings and to parking lots an electrically lighted sign bridge was erected over the main entrance road.

The following facilities for the electrical distribution system were installed: at Power Station A, air circuit breakers; at Power Station E, a current limiting reactor and oil switches; at Power Station K, a four-way load-break oil switch; and in Unit "C" area under the elevated road, electric service and panelboard.

On the field side of the terminal, bituminous pavement was excavated and replaced with concrete pavement for seven aircraft gate positions at Piers C and E. On a previously constructed fill, Runway 28L pavement was extended easterly 2,370 feet, bringing the total paved length to 9,500 feet. This contract included the extension of the parallel taxiway pavement and the construction of warm-up apron pavements and field lighting.

A service road was relocated and the site prepared to accommodate a wave guide localizer subsequently installed by the Federal Aviation Agency for the instrumental landing system at the west end of Runway 10L-28R. The localizer's operational requirements necessitated the relocation of a portion of old Bayshore Highway to avoid restriction of traffic.

An existing hump caused by the old Bayshore Highway crossing at the south end of Runway 1R and adjacent taxiway, was corrected with bituminous overlay pavement. As a preliminary measure to relocate tenants from the site of the future Air Cargo Building No. 4, crossover pavement and an access road at Taxiway S were constructed. In order to permit approaching aircraft to pre-empt the right-of-way, traffic control devices were installed at the intersection of Taxiway S and the service road.

At the end of the fiscal year, the first 2,100-foot portion of Taxiway H, east of and parallel to Runway 1R-19L, was under construction. This taxiway will provide additional aircraft access between the South Terminal area and Runways 28L and 28R. Under the same contract, deteriorated portions of Taxiway S and of the central 60 feet of Runway 10L-28R were restored to structural soundness and smoothness by excavation and replacement with new bituminous pavement and overlay. Construction of a high speed exit taxiway to enable incoming aircraft to quickly vacate Runway 28L, and the extension of the South Terminal apron to accommodate future Pier FF were also scheduled.

A contract was awarded for construction of a concrete pad for aircraft parking at Pier E, and parking pavement near Plot 3 for trucks transporting and delivering fuel directly to aircraft.

At year's end, major contracts were awarded or pending award to further increase the passenger-handling capability of the Terminals. The largest of these contracts was for alterations in the ground, first, and second floors of the Central Terminal building; additions to the lounge area on the second floor; and installation of another elevator to serve the first, second, and third floors. In the north baggage claiming area on the ground floor, one existing dispenser was to be relocated and two new dispensers installed. In the South Terminal area, car rental facilities were to be enlarged; additional controls for heating and ventilating to be installed; and floor covering to be laid in Piers F and G.

At the close of the fiscal year, bids were called for the construction of pavement and lighting to accommodate approximately 750 automobiles in Parking Area B; and the installation of a new 4-kv air circuit breaker in Power Station G for the Federal Aviation Agency field power circuits.

Status of Airport Construction Contracts

A summary of Airport construction contracts in progress during fiscal year 1963-64 is shown in Table 17.

Planning For Future Development

Engineering work required for Federal Aid Program Project No. 9-04-034-C421 was completed, and a grant offer of \$1,144,000 toward the cost of the project was received from the Federal Aviation Agency. The major portion of construction will be fill for the bayward extension of Runway 28R from 9,700 to 10,600 feet, as the first stage of a planned extension to 11,870 feet. This fill will be constructed by one of three optional methods: deposition of imported dry material in the bay waters; hydraulic deposition of sand excavated from the bay bottom; or construction of a levee followed by deposition of dry material. Other work includes the reconstruction of Taxiway D between Runway 28L and Taxiway C, the reconstruction of portions of apron and Taxiway A adjacent to the west end of Runway 10L, and the installation of a circuit breaker in Power Station G. Application for the grant involved preparation of plans, specifications, and an engineering report.

Federal aid was requested for projects to be scheduled for fiscal year 1965-66, primarily to convert Runway 28L to an instrument runway, and the construction of fill for the bayward extension of Runway 28R to 11,870 feet.

Contracts covering a four-foot high jet blast fence for the terminal aprons, and the installation of new flight announcing equipment in the Central Terminal building, were prepared and ready for advertising at the end of the year.

Plans and specifications were well under way for: construction of Pier FF; improvements to water and sewage systems in the South Terminal area; electrical distribution for plots along Roads R-3 and R-6; construction of Air Cargo Building No. 4 and associated pavement and utilities; removal of obstructions and relocation of facilities for the improvement of Runway 10R-28L; taxiway lighting; and boundary fencing.

Other improvements which were under study or in preliminary stages include: further development of the drainage control system; landing field pavement reconstruction; pavement and lighting for the extension of Runway 10R-28L at both ends; repaving of Parking Lot No. 2; a timber trestle in the bay waters to provide support for Runway 28L approach light system; short- and long-term improvements for increasing landing field capacity; and improvements to parking lot and street lighting.

Miscellaneous Engineering

Airport engineering work involved a broad spectrum of other activities. The Department gave technical assistance to various Airport tenants in development of plans for improvements, and was responsible for checking these plans and inspection of the actual construction. A set of regulations was being developed to govern tenants' construction activities and delineate the relationship between the Department and tenants in improvement matters. Lease drawings for Airport tenants were developed as required.

In cooperation with the State Regional Water Pollution Board, a bay water testing program was conducted throughout the year to determine the composition and quantity of industrial waste effluent from the Airport. Water samplings and flow measurements were taken on a 24-hour basis at several drainage discharge points in a series of six continuous five-day periods at about two-months intervals. Results of the 30 days of tests will aid in designing primary treatment facilities and other waste control improvements.

Drawings were prepared to furnish information to neighboring communities on construction height restrictions imposed by flight operations. The drawings will be distributed to communities and to other interested agencies for their information and comment.

Preliminary discussions were held with the State Division of Highways concerning the proposed State Route 229 interchange in the vicinity of San Bruno Avenue and Bayshore Freeway.

Data from several manufacturers on proposed monorail systems which would serve the Airport from downtown San Francisco were reviewed. A proposed heliport on the roof of the East Bay Terminal in San Francisco was also studied.

Financing

By June 30, 1964, \$30,210,000 had been spent under the \$25 million 1956 Airport bond program which has been supplemented by Federal aid for the development of the Airport. An additional \$4,029,000 was spent under the \$9.8 million 1962 Airport bond issue for the first stage of the multilevel parking garage.

During the year, funds were appropriated from Airport revenue as follows:

| | |
|--|-----------|
| Moving sidewalks | \$225,000 |
| Improvements to the electric power distribution system | 155,000 |
| Construction of an additional air cargo building | 600,000 |
| Construction of Gateroom 57 | 10,000 |
| Construction of Pier FF | 667,500 |
| Reconstruction of Pier D and the South Concourse | 450,000 |
| Paving auto parking areas | 82,000 |

1. 1940

2. 1941

3. 1942

4. 1943

5. 1944

6. 1945

7. 1946

8. 1947

9. 1948

10. 1949

Through Federal Aviation Agency, the Federal government granted \$1,143,952 to the City as its maximum share of participation in the construction of fill for the 900-foot bayward extension of Runway 28R, and in the reconstruction of certain taxiway and apron pavements. During the year, funds totaling \$345,000 were received from the Federal Aviation Agency for construction work completed under approved grants.

Taxes

The following table shows taxable land area, assessed valuation, and taxes paid for the San Francisco International Airport property in San Mateo County for the fiscal year 1963-64 as compared with the two previous years:

| | <u>1961-62</u> | <u>1962-63</u> | <u>1963-64</u> |
|----------------------------|----------------|----------------|----------------|
| Total Taxable Area (acres) | 4,947.14 | 4,947.14 | 4,947.14 |
| Total Assessed Value | \$1,196,995 | \$1,197,430 | \$3,425,225 |
| Total Amount Taxes Paid | \$ 89,334 | \$ 94,254 | \$ 266,193 |

The above tabulation includes taxes imposed by San Mateo County and the Cities of South San Francisco, San Bruno, San Mateo, Burlingame and Millbrae.

For the fiscal year 1963-64, the San Mateo County Assessor re-appraised all of the Airport lands. This resulted in an increase in the assessed valuation from \$1,189,460 in 1962-63 to \$3,924,800 for 1963-64. The City appealed to the State Board of Equalization for a reduction in this assessment. The appeal was heard in Sacramento on August 19-21, 1963. After the three-day hearing, the Board ruled that the County assessment be reduced to \$3,442,000. The Board allowed the appraisal of Airport lands to remain but reduced the assessment from 25 percent to 21.8 percent of appraised value, which is the county-wide average. The final County assessed valuation for Airport lands for 1963-64 was \$3,423,625 which resulted in an increase in County taxes from \$94,153.28 paid in 1962-63 to \$266,178.94 for 1963-64.

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of the country and the
main problems which are
facing the government.

2. The second part of the paper
describes the main problems
which are facing the government
and the main problems which
are facing the government.

3. The third part of the paper

describes the main problems
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are facing the government.

IV. MUNICIPAL RAILWAY ENGINEERING AND CONSTRUCTION

General

During the year, major design and construction efforts involved railway facility changes necessitated by the freeway construction program of the State of California. Work also continued on replacement of equipment for the Radio Communications Center on Twin Peaks and for mobile stations. In the latter part of the year, a series of contracts were awarded and manufacturing began for reconstruction of the cable winding machinery at Washington-Mason Cable Car Powerhouse. Design and preparation of plans for rehabilitation of Railway properties continued.

Construction work during the fiscal year was financed from the Municipal Railway Operating Fund, the Municipal Railway Reconstruction and Replacement Fund, and by the State under the freeway program.

Construction Relating To Freeway Program

Work required to accommodate the Southern Freeway was concentrated in the vicinity of Ocean and San Jose Avenues. Under separate contracts, the following were completed: track removal and construction at Elkton Yard; installation of permanent track on the Ocean Avenue overpass; installation of the overhead system on the Ocean Avenue overpass and removal of temporary detour overhead lines; trolley overhead construction at Elkton Yard and Geneva Carhouse; relocation of feeders for a temporary detour at San Jose Avenue and the Freeway; and feeder construction at San Jose Avenue and the Freeway.

Plans and specifications covering overhead construction for a temporary detour at 18th Street and the Southern-Embarcadero Freeway were 50 percent complete at year's end.

Replacement Of Radio System

In order to bring the mobile radio system up to standards of the Federal Communications Commission, work is in progress on replacement of the equipment at the Radio Communications Center on Twin Peaks and in mobile stations. Initially, interference caused by multiplicity of radio installations at the communications center prevented satisfactory operation on the proposed frequency of 44.58 megacycles. Extensive field tests established that the original operating frequency of 31.14 megacycles is optimum, and completion of the program is pending authorization by Federal Communications Commission to return to the original frequency.

Cable Winding Machinery

After eighty years' operation, the cable winding machinery for San Francisco's cable car system is beyond repair. The machinery, at Washington-Mason Powerhouse, is scheduled for replacement under a series of contracts. The latter part of the year, three of these contracts were awarded by the Purchaser of Supplies, for manufacturing and furnishing the following components: herringbone gear train; winder sheaves; and pillow blocks and shafts. The equipment is now being manufactured, and all other contracts for materials have been awarded.

The installation work is scheduled to be performed in December, 1964-January, 1965. Following completion, a visitors' gallery to view the cable winding operation and related machinery will be built.

Geneva Avenue Feeders

At year's end, due to widening of Geneva Avenue by Department of Public Works, a contract for relocation of feeders was awarded.

Buildings

The Geneva office building and Potrero Trolley Coach House office and shop buildings were reroofed. Plans and specifications covering roof repairs at the Bryant and Division Storeroom were complete at year's end.

Status Of Municipal Railway Construction Contracts

A summary of Municipal Railway construction contracts in progress during fiscal year 1963-64 is shown in Table 18.

Studies

During the year, the Department was engaged in various studies concerned with improvement of Municipal Railway operation. These studies included: power consumption of trolley coaches versus streetcars; warning light system for Twin Peaks Tunnel; review of the proposed Ferry Building Park; rehabilitation of railway equipment; and review of traffic code additions proposed by the Streets Utilities Committee.

A proposal for comprehensive study of Municipal Railway rehabilitation and coordination with Rapid Transit facilities was proposed to the Mayor through his Transportation Council. An appropriation of \$120,000 for the partial cost of this study was pending at the close of the fiscal year.

Rapid Transit

Bi-weekly conferences were held with representatives of San Francisco Bay Area Rapid Transit District to explore areas of common interest. The major concern was the effect of rapid transit on Municipal Railway plant and future operation. The problems involving operation of the Railway in the Market Street subway, the encroachment of the Ocean Avenue rapid transit station on the Elkton shops, and locations of other rapid transit stations, received intensive consideration.

As presently planned, rapid transit trains will occupy the lower level of the Market Street subway, and Municipal Railway cars the upper level connecting to Twin Peaks Tunnel. An additional subway will be built under West Portal to St. Francis Circle. Tandem operation of streetcars is being studied and use of rapid transit type cars is also being considered.

Staff members have been working closely with other City departments and with the Rapid Transit District in anticipation of the initial start of the Market Street subway in late 1968.

V. STREET LIGHTING

General

The lighting of public streets within the City of San Francisco is provided by facilities part of which are owned by the City, part by Pacific Gas and Electric Company and the remainder jointly-owned.

During the year 1963-64, maintenance and repair of City-owned installations was performed under a contract which included group lamp replacements, painting, repair of defective and damaged equipment, and miscellaneous work. Under another contract, Pacific Gas and Electric Company furnished street lighting services including maintenance of Company-owned equipment, switching and control of street lighting circuits, and emergency work as required. Electric energy for all street lighting operation was supplied by the City's Hetch Hetchy power system.

Studies continued on the overall requirements for illumination of public streets. Detail planning and design for changes, improvements, and additions to City-owned facilities in connection with street improvement projects were performed by Bureau of Engineering of the Department of Public Works. Final plans are reviewed by Public Utilities Commission through the Bureau of Light, Heat and Power.

Operation And Maintenance

As of June 30, 1964, a total of 30,556 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, tunnels, and underpasses, an increase of 1,201 during the year. The increase, in part, resulted from the program for modernization of Company-owned lighting in overhead districts. Improvements and additions to City-owned systems in underground districts also contributed to the increase. A summary of the number and types of units in service at the end of the fiscal year is shown in Table 11.

A total of \$985,934 was expended for operation, maintenance, and repair of the street lighting system. The year's cost per unit averaged \$32.41. Of the total cost, \$11,714 was paid by the State for its share of operation and maintenance of street lighting at intersections on City streets which are part of the State highway system.

A summary of expenditures for the fiscal year is shown in Table 12.

Improvements

In December, 1963, a program for modernization of Company-owned street lighting in overhead districts was inaugurated with the installation of the first mercury vapor luminaire. The program consists of replacing 13,200 obsolete incandescent lights with approximately 15,000 mercury vapor units, of twice the light output, within a three-year period. At year's end, the program was well ahead of schedule with approximately 3,000 units installed.

At a cost of \$378,664, a total of 453 new lights were added to the City-owned underground system. This represents the greatest improvement since fiscal year 1952-53. A summary of these additions is shown in Table 14. The historical cost of City-owned street lighting construction is shown in Table 15.

Complaints And Damages

During the year, 114 complaints requiring field investigation were received and acted upon. These complaints concerned inadequate illumination, objectionable glare in windows, and property owners requesting relocation of street lighting poles. In addition, there were approximately 500 complaints relating to the modernization program which did not require field investigation because they were resolved at the time of the complaint.

In 1963-64, there were 91 accidents involving damage to City-owned street lighting property. Investigation was made as soon as possible to remove hazards to the public and obstructions to traffic. Every effort was made to secure reimbursement for damages incurred from responsible parties. Total cost of repairs to damaged City-owned street lighting property was \$36,965.

A summary of accidents, cost of repairs, and collections is shown in Table 13.

VI. UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated by the Hetch Hetchy power system and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas and steam supplied to municipal departments was furnished by Pacific Gas and Electric Company under provisions of its contract with the Department.

Municipal Consumption Of Electricity, Gas And Steam

During the fiscal year 1963-64, a total of 293,160,152 kilowatt-hours of electricity was supplied through 809 accounts for municipal uses, including street lighting and traffic devices. City departments paid to the Hetch Hetchy Project a total of \$3,093,202 for electricity. At the same time, 14,856,685 hundred cubic feet of natural gas was consumed through 501 accounts, and 2,050,800 pounds of steam was utilized by one account, for which Pacific Gas and Electric Company was paid \$812,122 and \$3,415 respectively.

A summary of consumption and expenditures for these commodities is shown in Tables 9 and 10.

Gas Account Refunds

During the year, refunds to municipal gas accounts were made by Pacific Gas and Electric Company amounting to over \$200,000. Small user accounts received credits on their August, 1963, and February, 1964, bills. Refunds to large user accounts were made by checks which were deposited with the City Treasurer to the credit of the respective departments. The following tabulation shows the amounts:

| | <u>Aug. 1963</u> | <u>Feb. 1964</u> | <u>Total</u> |
|---------------------------------|------------------|------------------|------------------|
| <u>Credits Applied to Bills</u> | | | |
| Municipal Departments | \$ 3,766 | \$ 8,509 | \$ 12,275 |
| Academy of Sciences | 21 | 102 | 123 |
| <u>Cash Refunds</u> | | | |
| Municipal Departments | 62,878 | 127,079 | 189,957 |
| Academy of Sciences | 694 | 1,557 | 2,251 |
| <u>Total</u> | <u>\$67,359</u> | <u>\$137,247</u> | <u>\$204,606</u> |

These refunds were the result of a California Public Utilities Commission order directing Pacific Gas and Electric Company to pass on to their customers refunds the Company received from El Paso Natural Gas Company. The refunds resulted from settlement of proceedings before Federal Power Commission regarding four successive rate increases by El Paso Natural Gas Company. It was the result of

nine years of litigation in which California Public Utilities Commission, State Attorney General and other public officials, Pacific Gas and Electric Company and other utilities, joined in pressing for gas refunds and reductions. The amount of settlement was established by negotiations between California Public Utilities Commission and El Paso Natural Gas Company.

San Francisco International Airport

The Department served San Francisco International Airport in the operation of City-owned electric distribution system within the Airport boundary. This service included supervising installation and testing of the associated metering facilities, performing necessary monthly meter readings, and preparing statements for billing Airport tenants. During the fiscal year, 73 tenants were supplied a total of 58,562,854 kilowatt-hours of electricity through 215 metered and 54 unmetered accounts, for which the Airport Department collected \$748,043. Also, one tenant was supplied 7,196,200 pounds of steam through two meters, for which the Airport Department collected \$6,867.

* * *

TABLE 1
HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)
FISCAL YEAR 1963-64

| <u>OE</u> | <u>DESCRIPTION</u> | <u>BUDGET</u> | <u>ACTUAL</u> | <u>-UNDER, OVER</u> |
|-----------|--|----------------------------|----------------------------|--------------------------|
| 110 | Permanent Salaries | \$ 323,046 | \$ 307,071 | \$-15,975 |
| 111 | Allowance for Overtime | 2,200 | 2,198 | -2 |
| 112 | Allowance for Holidays | 4,970 | 1,335 | -3,635 |
| 113 | Extended Work Week | 19,991 | 17,014 | -2,977 |
| 120 | Temporary Salaries | 16,000 | 11,624 | -4,376 |
| 130 | Wages | 669,119 | 648,906 | -20,213 |
| 139 | Salaries - Gardeners | 24,396 | 24,396 | -0- |
| 200 | Contractual Service | 59,106 | 45,683 | -13,423 |
| 216 | Maint. & Repair of Auto Equip. | 32,000 | 29,281 | -2,719 |
| 231-1 | Purchase of Power for Resale | 788,600 | 833,313 | 44,713 |
| 231-2 | Service Charge for Transm. & Dist. | 2,046,300 | 2,193,596 | 147,296 |
| 251 | Subsistence of Employees | 16,000 | 8,696 | -7,304 |
| 295 | Legislative Expense | 2,500 | 842 | -1,658 |
| 300 | Material and Supplies | 62,000 | 60,813 | -1,187 |
| 350 | Foodstuffs | 12,581 | 13,168 | 587 |
| 640 | Water Rights and Damage Claims | 22,750 | 18,161 | -4,589 |
| 641 | Hydrography | 27,222 | 25,871 | -1,351 |
| 801 | Accident Compensation | 5,000 | 2,900 | -2,100 |
| 812 | Fidelity Insurance | 53 | 43 | -10 |
| 813 | Automobile Insurance | 4,060 | 2,958 | -1,102 |
| 814 | Fire Insurance | 11,500 | 6,206 | -5,294 |
| 815 | Miscellaneous Insurance | 10,000 | 7,699 | -2,301 |
| 854 | Membership Dues | 271 | 260 | -11 |
| 855 | Fee to U.S. Gov't - Raker Act | 30,000 | 30,000 | -0- |
| 856 | Maint. Roads & Trails - Raker Act | 25,000 | 9,695 | -15,305 |
| 860 | Retirement Allowance | 67,537 | 66,426 | -1,111 |
| 862 | Social Security | 13,920 | 15,573 | 1,653 |
| 865 | Health Service System | 15,572 | 15,761 | 189 |
| 870 | Taxes | 232,600 | 210,361 | -22,239 |
| 880 | Rentals - Transmission Lines | 54,000 | 54,000 | -0- |
| 900 | Services of Other Depts. | 450,880 | 379,698 | -71,182 |
| | TOTAL OPERATION AND MAINTENANCE | \$5,049,174 | \$5,043,548 | \$ -5,626 |
| 400 | Equipment | 64,230 | 67,051 | 2,821 |
| 500 | Additions and Betterments | 102,760 | 102,760* | -0- |
| 700 | Reconstruction and Replacement | 59,700 | 59,700* | -0- |
| 800 | Bond Interest and Redemption | 8,658,014 | 8,448,734 | -209,280 |
| | TOTAL | <u>\$13,933,878</u> | <u>\$13,721,793</u> | <u>\$-212,085</u> |

* Unexpended balance transferred to unallocated balance of appropriation.

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TABLE 2
HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1963-64

| | <u>BUDGET</u> | <u>ACTUAL</u> | <u>-UNDER
OVER</u> |
|--|-------------------|---------------------|------------------------|
| <u>RECEIPTS</u> | | | |
| Revenue from Sale of Electric Energy | \$ 9,723,400 | \$10,794,462 | \$1,066,062 |
| Revenue from Sale of Water and
Standby Charge, SFWD | 4,500,000 | 4,500,000 | -0- |
| Other Revenue | 65,000 | 51,807 | -13,193 |
| | <hr/> | <hr/> | <hr/> |
| TOTAL GROSS REVENUE | \$14,293,400 | \$15,346,269 | \$1,052,869 |
|
<u>EXPENDITURES</u> | | | |
| Total Expenditures (from Table 1) | \$13,933,878 | \$13,721,793 | \$ -212,085 |
| | <hr/> | <hr/> | <hr/> |
| <u>EXCESS OF REVENUE OVER EXPENDITURES</u> | <u>\$ 359,522</u> | <u>\$ 1,624,476</u> | <u>\$1,264,954</u> |

TABLE 3
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

| | Normal | 1959-60 | 1960-61 | 1961-62 | 1962-63 | 1963-64 |
|--|----------------------|-----------|-------------|-------------|---------------|---------------|
| SEASON PRECIPITATION (INCHES) | | | | | | |
| Hetch Hetchy | 33.90 | 26.10 | 23.38 | 33.57 | 40.08 | 25.28 |
| Lake Lloyd | --- | 39.32 | 24.47 | 48.48 | 52.33 | 34.95 |
| Approx. Percent of Normal | | 77% | 69% | 99% | 118% | 75% |
| WATERSHED RUNOFF (ACRE-FT.) (a)(d) | | | | | | |
| Hetch Hetchy | 723,100 ^c | 494,776 | 375,434 | 783,989 | 837,280 | 509,000 (b) |
| Lake Lloyd | 263,300 | (297,039) | (203,059) | (446,178) | (438,700) | (305,000 (b)) |
| Lake Eleanor | 157,900 | 791,815 | 578,493 | 1,230,167 | 1,275,980 | 814,000 (b) |
| Total | 1,144,300 | 69% | 52% | 108% | 112% | 71% (b) |
| Approx. Percent of Normal | | | | | | |
| RESERVOIR STORAGE (ACRE-FT.) (d) | No-Spill Capacity | | | | | |
| Hetch Hetchy | 360,360 | 297,730 | 195,572 | 355,244 | 353,480 | 337,935 |
| Lake Lloyd | 268,200 | 124,868 | 69,973 | 248,577 | 266,112 | 117,406 |
| Lake Eleanor | 27,100 | 11,414 | 11,331 | 26,436 | 25,681 | 8,946 |
| Total | 655,660 | 434,012 | 276,876 | 630,257 | 645,273 | 464,287 |
| DELIVERY TO SFWD (ACRE-FT.) (d) | | | | | | |
| Average per day | | 489 | 445 (c) | 432 (c) | 396 (c) | 405 (c) |
| Maximum per day | | 502 | 500 (c) | 502 (c) | 494 (c) | 533 (c) |
| Total for fiscal year | | 179,154 | 162,547 (c) | 175,903 (c) | 140,769 (c) | 148,287 (c) |
| Total since operation of Hetch Hetchy Aqueduct began in 1934 | | | | | 2,317,420 (c) | |

NOTES: (a) For Water Year, November 1 to October 31.
 (b) Estimated.
 (c) Includes delivery to Livermore site, U. S. Atomic Energy Commission.
 (d) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.

TABLE 4
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1963-64

| <u>PLANT DATA</u> | <u>Rated Capacity</u>
<u>(Kilowatts)</u> | <u>Peak Generation</u>
<u>(Kilowatts)</u> | <u>Annual Load</u>
<u>Factor - %</u> |
|-------------------------|---|--|---|
| Moccasin Powerhouse | 70,000 | 82,000 | 73.6 |
| Cherry Powerhouse | 135,000 | 150,000 | 74.1 |
| Early Intake Powerhouse | 3,600 | 500 | --- |
| Total | 208,600 | 232,000 (Coincidental) | |

ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)

Gross Generation

| | | |
|-----------------------------------|--------------|---------------|
| Moccasin Powerhouse | 528,390,000 | |
| Cherry Powerhouse | 973,986,000 | |
| Early Intake Powerhouse (Standby) | <u>4,400</u> | 1,502,330,400 |

Station Service

| | | |
|-----------------------------------|-----------|------------------|
| Moccasin Powerhouse | 819,600 | |
| Cherry Powerhouse | 1,389,120 | |
| Early Intake Powerhouse (Standby) | <u>5</u> | <u>2,208,725</u> |

Net Generation

1,500,171,675

Supplementary Energy

| | | |
|----------------------------|--------------------|--------------------|
| P.G.& E. Co. (Replacement) | 4,252,209 | |
| P.G.& E. Co. (Purchase) | <u>114,717,222</u> | <u>118,969,431</u> |

Total

1,619,141,106

ENERGY DISTRIBUTED (KILOWATT-HOURS)

Sales

| | |
|--|-------------|
| Municipal Accounts | 293,160,152 |
| Modesto Irrigation District | 386,283,000 |
| Turlock Irrigation District | 151,771,700 |
| Permanente Cement Company | 155,337,840 |
| Kaiser Aluminum and Chemical Corporation | 14,496,000 |
| Dow Chemical Company | 303,892,152 |
| Hercules Powder Company | 133,758,000 |
| Shell Chemical Company | 66,618,000 |
| Miscellaneous Customers | 12,406,416 |

Non-Revenue

| | |
|--|-----------|
| Project Use | 3,627,929 |
| Pacific Gas and Electric Company (Replacement) | 0 |

Losses

| | |
|---|-------------------|
| Hetch Hetchy System | 35,324,550 |
| P.G.& E. System (Municipal and Industrial Accounts) | <u>62,415,367</u> |

Total

1,619,141,106

TABLE 5
HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1962-63 AND 1963-64

(Nearest 100,000 Kilowatt-Hours)

| <u>CUSTOMER</u> | <u>1962-63</u> | <u>1963-64</u> |
|------------------------------------|----------------------|----------------------|
| Municipal Accounts | | |
| Street Lighting | 36,300,000 | 36,600,000 |
| Public Works | 17,900,000 | 18,700,000 |
| S. F. International Airport | 64,400,000 | 76,600,000 |
| Municipal Railway | 67,000,000 | 68,000,000 |
| Water Department | 29,500,000 | 33,300,000 |
| S. F. Unified School District | 19,200,000 | 20,000,000 |
| Other City Departments | 37,600,000 | 39,900,000 |
| Modesto Irrigation District | 343,300,000 | 386,300,000 |
| Turlock Irrigation District | 118,500,000 | 151,800,000 |
| Permanente Cement Company | 138,800,000 | 155,400,000 |
| Kaiser Aluminum and Chemical Corp. | 14,400,000 | 14,500,000 |
| Dow Chemical Company | 301,800,000 | 303,900,000 |
| Hercules Powder Company | 23,600,000 | 133,800,000 |
| Shell Chemical Company | --- | 66,600,000 |
| All Other Sales | 9,000,000 | 12,400,000 |
| | <u>1,221,300,000</u> | <u>1,517,800,000</u> |
| TOTAL | | |

TABLE 6
HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1962-63 AND 1963-64

(Nearest \$1,000)

| <u>CUSTOMER</u> | <u>1962-63</u> | <u>1963-64</u> |
|------------------------------------|--------------------|---------------------|
| Municipal Accounts | | |
| Street Lighting | \$ 386,000 | \$ 388,000 |
| Public Works | 218,000 | 226,000 |
| S. F. International Airport | 555,000 | 644,000 |
| Municipal Railway | 678,000 | 688,000 |
| Water Department | 261,000 | 289,000 |
| S. F. Unified School District | 321,000 | 333,000 |
| Other City Departments | 500,000 | 525,000 |
| Modesto Irrigation District | 1,762,000 | 1,978,000 |
| Turlock Irrigation District | 625,000 | 776,000 |
| Permanente Cement Company | 1,200,000 | 1,281,000 |
| Kaiser Aluminum and Chemical Corp. | 98,000 | 99,000 |
| Dow Chemical Company | 2,066,000 | 2,063,000 |
| Hercules Powder Company | 160,000 | 916,000 |
| Shell Chemical Company | --- | 451,000 |
| All Other Sales | 101,000 | 137,000 |
| | <u>\$8,931,000</u> | <u>\$10,794,000</u> |
| TOTAL | | |

TABLE 7
HETCH HETCHY POWER SYSTEM

| ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS - KILOWATTHOURS | | | | | |
|---|-------------|-------------|---------------|---------------|---------------|
| | 1958-59 | 1959-60 | 1960-61 | 1961-62 | 1962-63 |
| NET GENERATION | | | | | 1963-64 |
| Moccasin Powerhouse | 527,023,100 | 519,258,400 | 469,300,100 | 390,534,500 | 527,332,900 |
| Cherry Powerhouse | --- | --- | 451,179,360 | 398,956,200 | 759,063,980 |
| Early Intake Powerhouse | 27,876,552 | 17,951,026 | 1,749,306 | 0 | 28,990 |
| Subtotal | 554,899,652 | 537,209,426 | 922,228,766 | 789,490,700 | 1,286,425,870 |
| | | | | | 1,500,171,675 |
| SUPPLEMENTARY ENERGY | | | | | |
| P.G.& E. Co. (Replacement) | --- | --- | --- | --- | 17,614,531 |
| P.G.& E. Co. (Purchase) | 202,433,126 | 384,528,298 | 116,235,950 | 401,108,639 | 10,765,998 |
| Subtotal | 202,433,126 | 384,528,298 | 116,235,950 | 401,108,639 | 28,380,439 |
| TOTAL | 757,332,778 | 921,737,724 | 1,038,464,716 | 1,190,599,339 | 1,314,806,309 |
| DISTRIBUTION | | | | | |
| Sales | | | | | |
| Municipal Accounts | 235,557,361 | 252,584,748 | 257,641,932 | 268,283,987 | 271,930,805 |
| Modesto Irrig. Dist. | 192,134,400 | 300,501,600 | 348,864,000 | 353,976,000 | 343,344,000 |
| Turlock Irrig. Dist. | 66,007,346 | 130,742,402 | 169,960,571 | 170,649,231 | 118,488,000 |
| Permanente Cement Co. | 166,572,310 | 152,045,469 | 140,764,680 | 141,273,870 | 193,773,712 |
| Kaiser Aluminum Corp. | 12,000,000 | 13,272,000 | 13,152,000 | 13,776,000 | 14,424,000 |
| Dow Chemical Co. | --- | --- | 44,011,368 | 156,102,552 | 301,810,584 |
| Hercules Powder Co. | --- | --- | --- | --- | 23,544,000 |
| Shell Chemical Co. | --- | --- | 668,872 | 650,398 | 9,010,930 |
| Misc. Customers | 6,585,970 | 4,197,071 | 1,060,607 | --- | --- |
| P.G.& E. Co. (Dump) | --- | --- | --- | --- | --- |
| Non-Revenue | | | | | |
| Project Use | 3,007,776 | 3,246,239 | 3,168,162 | 3,535,696 | 3,314,272 |
| P.G.& E. Co. (Replacement) | --- | --- | --- | 13,426,572 | 8,440,168 |
| Losses | 75,467,615 | 65,148,195 | 64,172,524 | 68,925,033 | 81,725,833 |
| TOTAL | 757,332,778 | 921,737,724 | 1,038,464,716 | 1,190,599,339 | 1,314,806,309 |
| | | | | | 1,619,141,106 |

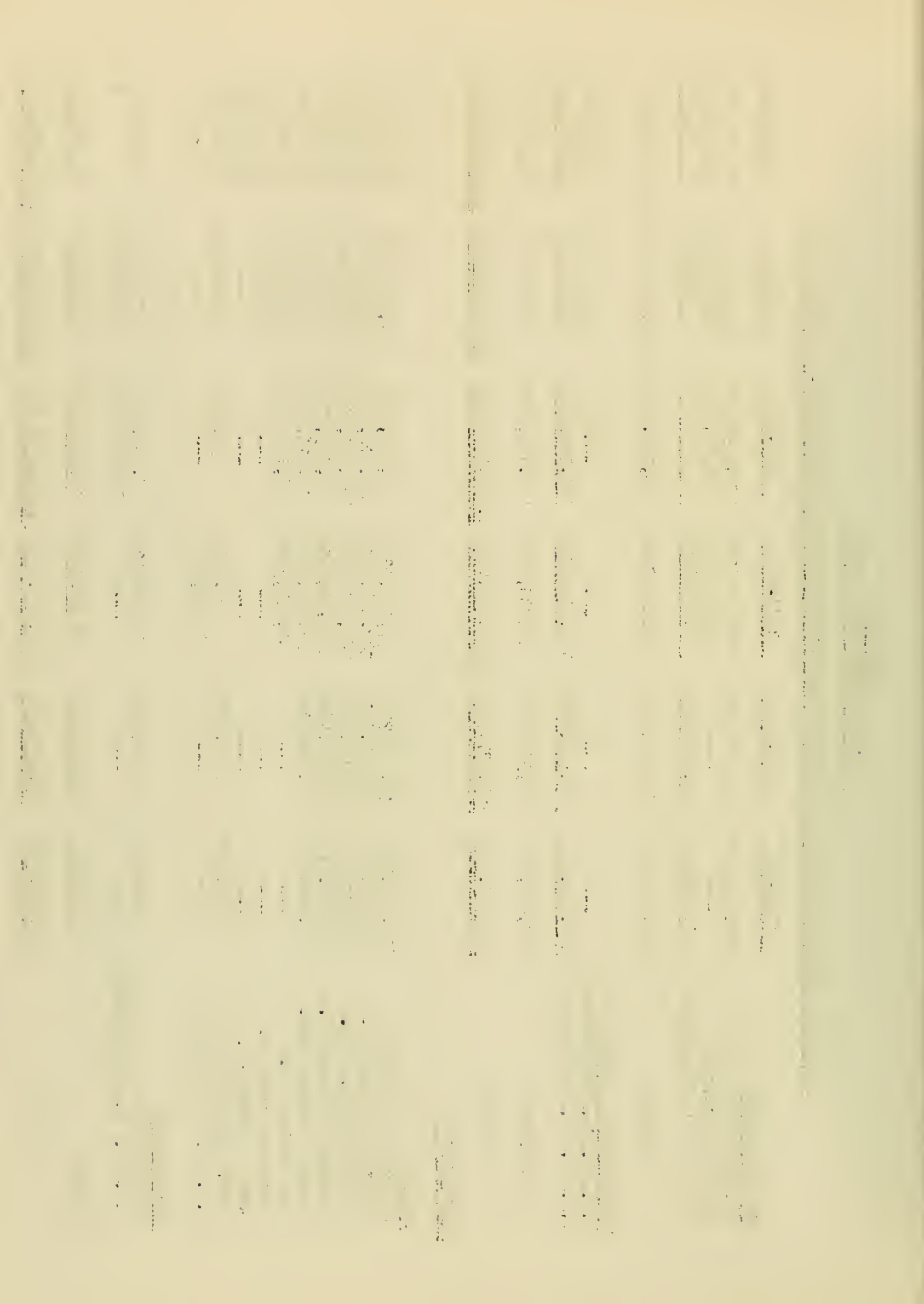


TABLE 8
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1963-64

| <u>OE</u> | <u>DESCRIPTION</u> | <u>BUDGET</u> | <u>ACTUAL</u> | <u>-UNDER
OVER</u> |
|---------------------|-------------------------------|--------------------|--------------------|------------------------|
| <u>EXPENDITURES</u> | | | | |
| 110 | Permanent Salaries | \$ 97,625 | \$ 90,851 | \$-6,774 |
| 111 | Allowance for Overtime | 300 | 299 | -1 |
| 200 | Contractual Services | 3,005 | 1,339 | -1,666 |
| 214 | Alteration and Repair of | | | |
| | Street Lighting Structures | 2,000 | 2,048 | 48 |
| 214-1 | Maintenance and Repair of | | | |
| | Street Lighting Installations | 89,300 | 77,418 | -11,882 |
| 231 | Lighting and Heating of | | | |
| | Public Buildings - General | 937,616 | 854,169 | -83,447 |
| 231-1 | Lighting and Heating of | | | |
| | Public Bldg. - Special Funds | 2,716,005 | 2,676,804 | -39,201 |
| 231-2 | Lighting of Public Streets - | | | |
| | Pacific Gas and Electric Co. | 500,036 | 502,066 | 2,030 |
| 231-3 | Lighting of Public Streets - | | | |
| | Hetch Hetchy | 383,671 | 376,826 | -6,845 |
| 300 | Materials and Supplies | 725 | 658 | -67 |
| 400 | Equipment | 505 | 582 | 77 |
| 801 | Accident Compensation | 100 | -0- | -100 |
| 813 | Auto Insurance | 300 | 215 | -85 |
| 860 | Retirement Allowance | 6,107 | 5,077 | -1,030 |
| 862 | Social Security | 1,740 | 1,432 | -308 |
| 865 | Health Service System | 2,057 | 2,225 | 168 |
| TOTAL | | <u>\$4,741,092</u> | <u>\$4,592,009</u> | <u>\$-149,083</u> |
| <u>RECEIPTS</u> | | | | |
| | Interfund Receipts * | \$2,763,455 | \$2,720,657 | \$ -42,798 |
| | Ad Valorem Taxes | <u>1,977,637</u> | <u>1,871,352</u> | <u>-106,285</u> |
| TOTAL | | <u>\$4,741,092</u> | <u>\$4,592,009</u> | <u>\$-149,083</u> |

* Transfers from other departments.

1. The first group of people who are interested in the study of the history of the United States are the people who are interested in the history of the United States.

1. The first part of the document is a list of names and their corresponding page numbers. The names are listed in a single column, and the page numbers are listed in a single column to the right of the names. The names are:

- 1. The first part of the document is a list of names and their corresponding page numbers. The names are listed in a single column, and the page numbers are listed in a single column to the right of the names. The names are:

Journal of Management Studies, 19(1), 67-80.

[illegible]

TABLE 9
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1963-64

| <u>DEPARTMENT</u> | <u>NO. OF
ACCOUNTS</u> | <u>CONSUMPTION
KILOWATT-HOURS</u> | <u>EXPENDITURE</u> |
|--------------------------------------|----------------------------|---------------------------------------|---------------------|
| Art Museum | - | 522,396 | \$ 6,563 |
| Auditorium and Brooks Hall | 1 | 1,302,700 | 17,338 |
| Child Care Centers | 8 | 66,940 | 1,732 |
| City Planning | 1 | 73,200 | 1,512 |
| DeYoung Museum | 2 | 442,160 | 6,886 |
| Disaster Corps | 2 | 2,226 | 94 |
| Electricity | 4 | 405,136 | 7,195 |
| Farmers Market | 1 | 5,372 | 148 |
| Fire (a) | 58 | 1,773,635 | 39,831 |
| Hassler Health Home | 1 | 644,760 | 7,412 |
| Health | 21 | 6,474,795 | 67,362 |
| Hetch Hetchy | 6 | 94,716 | 2,721 |
| International Airport (Incl.resale) | 8 | 76,574,784 | 644,546 |
| Legion of Honor | 5 | 285,672 | 5,561 |
| Library | 30 | 2,073,278 | 35,263 |
| Log Cabin Ranch | 9 | 254,385 | 6,981 |
| Municipal Railway | 39 | 68,004,507 | 687,582 |
| Police | 18 | 552,087 | 12,040 |
| Public Buildings | 8 | 11,740,887 | 111,875 |
| Public Welfare | 2 | 321,280 | 4,609 |
| Public Works | 48 | 18,743,393 | 221,101 |
| Purchasing | 6 | 359,164 | 5,817 |
| Real Estate | 1 | - | 1 |
| Recreation and Park | 180 | 7,725,202 | 127,364 |
| Sheriff | 2 | 927,360 | 9,885 |
| Street Lighting Operations | - | 36,608,949 | 376,826 |
| Unified School District | 243 | 20,028,328 | 332,864 |
| War Memorial | 2 | 858,404 | 11,880 |
| Water | 96 | 33,341,240 | 289,050 |
| Youth Guidance | 1 | 1,160,160 | 12,554 |
| TOTAL MUNICIPAL DEPARTMENTS | 803 | 291,367,116 | \$ 3,054,593 |
| Academy of Sciences | 4 | 1,793,036 | 19,169 |
| Flower Show | - | (b) | 1,473 |
| Mount Davidson Cross Lighting | - | (b) | 1,300 |
| State of Calif.: Street Lighting | 1 | (c) | 11,714 |
| Traffic Devices | 1 | (d) | 4,953 |
| TOTAL FROM HETCH HETCHY | 809 | 293,160,152 | \$ 3,093,202 |
| Fire Dept., For Resale to Fort Mason | 1 | 4,108,000 | 49,185 |
| GRAND TOTAL | 810 | 297,268,152 | \$ 3,142,387 |

NOTES: (a) Does not include electricity purchased for resale to Fort Mason
 (b) Included under Recreation and Park
 (c) Included under Street Lighting Operations
 (d) Included under Public Works

1917

1. The first part of the report deals with the general situation of the country. It is a very interesting and comprehensive survey of the country's resources, its population, and its economic conditions. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is a valuable contribution to the knowledge of the country and its people.

2. The second part of the report deals with the specific details of the country's resources. It is a very detailed and thorough survey of the country's natural resources, its agricultural products, and its industrial resources. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is a valuable contribution to the knowledge of the country and its people.

3. The third part of the report deals with the specific details of the country's population. It is a very detailed and thorough survey of the country's population, its distribution, and its characteristics. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is a valuable contribution to the knowledge of the country and its people.

4. The fourth part of the report deals with the specific details of the country's economic conditions. It is a very detailed and thorough survey of the country's economic conditions, its production, and its consumption. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is a valuable contribution to the knowledge of the country and its people.

5. The fifth part of the report deals with the specific details of the country's political conditions. It is a very detailed and thorough survey of the country's political conditions, its government, and its laws. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is a valuable contribution to the knowledge of the country and its people.

TABLE 10
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1963-64

NATURAL GAS

| <u>DEPARTMENT</u> | <u>NO. OF
ACCOUNTS</u> | <u>CONSUMPTION
HUNDRED CU. FT.</u> | <u>EXPENDITURE *</u> |
|------------------------------------|----------------------------|--|----------------------|
| Auditorium and Brooks Hall | 2 | 268 | \$ 37 |
| Child Care Centers | 8 | 24,595 | 1,374 |
| City Planning | 1 | 5,504 | 294 |
| DeYoung Museum | 2 | 59,894 | 3,376 |
| Disaster Corps | 1 | 346 | 31 |
| Electricity | 2 | 43,959 | 2,653 |
| Farmers Market | 1 | 534 | 41 |
| Fire | 59 | 623,812 | 35,414 |
| Hassler Health Home | 2 | 285,054 | 17,853 |
| Health | 18 | 3,860,490 | 182,535 |
| Hetch Hetchy | 2 | 2,224 | 158 |
| International Airport | 14 | 1,325,365 | 64,345 |
| Library | 27 | 92,672 | 5,242 |
| Municipal Railway | 12 | 250,521 | 15,654 |
| Police | 10 | 55,115 | 2,907 |
| Public Buildings | 4 | 1,176,091 | 60,325 |
| Public Works | 10 | 342,736 | 23,885 |
| Purchasing | 3 | 60,634 | 3,562 |
| Real Estate | 1 | 167 | 3 |
| Recreation and Park | 100 | 1,165,059 | 71,178 |
| Registrar of Voters | 1 | 14,051 | 995 |
| Sheriff | 2 | 406,909 | 21,305 |
| Single Men's Rehabilitation Center | 1 | 38,524 | 2,459 |
| Unified School District | 197 | 4,096,465 | 245,405 |
| War Memorial | 3 | 200,611 | 12,407 |
| Water | 14 | 84,981 | 5,313 |
| Youth Guidance | 2 | 423,300 | 21,854 |
| TOTAL MUNICIPAL DEPARTMENTS | 499 | 14,639,881 | \$800,605 |
| Academy of Sciences | 2 | 216,804 | 11,517 |
| GRAND TOTAL | 501 | 14,856,685 | \$812,122 |

STEAM

(Does not include steam generated by City)

| <u>DEPARTMENT</u> | <u>NO. OF
ACCOUNTS</u> | <u>CONSUMPTION
POUNDS</u> | <u>EXPENDITURE</u> |
|-------------------|----------------------------|-------------------------------|--------------------|
| Public Welfare | 1 | 2,050,800 | \$ 3,415 |

* Includes refund credit from settlement of proceedings involving El Paso Natural Gas Company.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1964

| <u>SIZE & TYPE OF LAMP</u> | <u>COMPANY-
OWNED</u> | <u>JOINTLY-
OWNED</u> | <u>CITY-
OWNED</u> | <u>TOTAL</u> |
|-------------------------------------|---------------------------|---------------------------|------------------------|---------------|
| <u>UNDERGROUND CONNECTED</u> | | | | |
| <u>High voltage series circuit</u> | | | | |
| 1,000 Lumen Incandescent | -- | 22 | -- | 22 |
| 2,500 " " | 324 | 192 | 480 | 996 |
| 4,000 " " | 2,410 | 552 | 2,819 | 5,781 |
| 6,000 " " | 819 | 620 | 4,699 | 6,138 |
| 10,000 " " | 401 | -- | 563 | 964 |
| 23,000 " Fluorescent | 5 | -- | 19 | 24 |
| 175 Watt Mercury Vapor | 1 | -- | 24 | 25 |
| 400 " " | 11 | 45 | 70 | 126 |
| 1,000 " " | -- | -- | 3 | 3 |
| <u>Low voltage multiple circuit</u> | | | | |
| 1,000 Lumen Incandescent | -- | -- | 173 | 173 |
| 2,500 " " | 11 | 4 | 19 | 34 |
| 4,000 " " | 193 | 3 | 55 | 251 |
| 6,000 " " | 81 | 9 | 70 | 160 |
| 10,000 " " | 2 | -- | 16 | 18 |
| 23,000 " Fluorescent | 36 | -- | 100 | 136 |
| 100 Watt Mercury Vapor | -- | -- | 9 | 9 |
| 175 " " | 1 | -- | 171 | 172 |
| 250 " " | -- | -- | 69 | 69 |
| 400 " " | 775 | -- | 575 | 1,350 |
| 1,000 " " | -- | -- | 6 | 6 |
| <u>OVERHEAD CONNECTED</u> | | | | |
| <u>High voltage series circuit</u> | | | | |
| 2,500 Lumen Incandescent | 196 | -- | -- | 196 |
| 4,000 " " | 10,183 | -- | 57 | 10,240 |
| 6,000 " " | 256 | -- | 2 | 258 |
| <u>Low voltage multiple circuit</u> | | | | |
| 2,500 Lumen Incandescent | 23 | -- | -- | 23 |
| 4,000 " " | 365 | -- | 1 | 366 |
| 6,000 " " | 160 | -- | 18 | 178 |
| 10,000 " " | -- | -- | 1 | 1 |
| 175 Watt Mercury Vapor | 2,539 | -- | -- | 2,539 |
| 250 " " | 263 | -- | 2 | 265 |
| 400 " " | 33 | -- | -- | 33 |
| TOTAL AS OF JUNE 30, 1964 | <u>19,088</u> | <u>1,447</u> | <u>10,021</u> | <u>30,556</u> |
| | 62.47% | 4.73% | 32.80% | 100% |
| TOTAL AS OF JUNE 30, 1963 | <u>18,271</u> | <u>1,551</u> | <u>9,533</u> | <u>29,355</u> |
| NET CHANGE DURING THE YEAR | +817 | -104 | +488 | +1,201 |

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TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1963-64

CONTRACTUAL SERVICE (P. G. & E. COMPANY)

| | | | |
|--|--------------|----------------|-----------|
| Company-owned facilities (a) | \$722,838 | | |
| Jointly-owned facilities (a) | 64,451 | | |
| City-owned facilities (b) | 206,152 | | |
| Emergency service to City-owned facilities | <u>2,602</u> | \$996,043 | |
| Less deduction for energy component | | <u>477,629</u> | \$518,414 |

CONTRACTUAL SERVICE (ENSCO ELECTRIC CORPORATION)

| | | | |
|--------------------------------------|--------------|---------------|--------|
| Maintenance of City-owned facilities | | | |
| Group replacement of lamps | 30,762 | | |
| Routine maintenance | <u>7,443</u> | 38,205 | |
| Repair of City-owned facilities | | | |
| Damages caused by accidents (c) | 24,046 | | |
| Damages caused by equipment failure | <u>8,466</u> | <u>32,512</u> | 70,717 |

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

| | | | |
|-------------------------------------|--------------|--|-------|
| Damages caused by accidents (c) | 6,236 | | |
| Damages caused by equipment failure | <u>1,579</u> | | 7,815 |

ELECTRIC ENERGY (HETCH HETCHY)

| | | | |
|--|--|--|----------------|
| 36,608,949 kwh @ \$0.01345 less 21% discount (d) | | | <u>388,988</u> |
|--|--|--|----------------|

| | | | |
|-------------------|--|--|-----------|
| TOTAL EXPENDITURE | | | \$985,934 |
|-------------------|--|--|-----------|

LESS AMOUNT PAID TO HETCH HETCHY FROM:

| | | | |
|---|------------|--|---------------|
| Gas Tax Funds for State Highway routes | 11,714 | | |
| Recreation and Park Dept. for off-street lighting | <u>449</u> | | <u>12,163</u> |

| | | | |
|-----------------------|--|--|------------------|
| TOTAL NET EXPENDITURE | | | <u>\$973,771</u> |
|-----------------------|--|--|------------------|

AVERAGE OPERATING COST

| | | | |
|---|--|--|----------------|
| Based on number of lights in service June 30, 1964, average total cost of operation, maintenance and repair per light per year: | | | <u>\$32.41</u> |
|---|--|--|----------------|

- NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.
- (b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.
- (c) When responsible party is known, claim is filed for recovery of costs. (See Table 13)
- (d) Energy for municipal purposes is furnished at 21% discount.

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TABLE 13
BUREAU OF LIGHT, HEAT AND POWER
ACCIDENT DAMAGE TO CITY-OWNED STREET LIGHTING
BY FISCAL YEARS

| | <u>1960-61</u> | <u>1961-62</u> | <u>1962-63</u> | <u>1963-64</u> |
|---|----------------|----------------|----------------|--------------------------|
| Number of Accidents | 86 | 89 | 85 | 91 |
| Cost of Damage Repairs (a) | \$ 30,412 | \$ 25,740 | \$ 35,323 | \$ 36,965 ^(b) |
| Average Cost Per Accident | 354 | 289 | 416 | 406 (b) |
| Amount Billed Responsible Parties (c) | 21,683 | 32,361 | 27,818 | 23,759 |
| Amount Collected: | | | | |
| By Bureau of Light, Heat and Power | 7,852 | 14,010 | 11,070 | 15,995 |
| By Bureau of Delinquent Revenue (d) (e) | 2,663 | 6,855 | 8,658 | 7,803 |
| Amount Abandoned (Uncollectible) | 3,646 | 8,724 | 4,269 | 9,096 |
| Amount Receivable June 30: | | | | |
| Payable to Bureau of Light, Heat and Power | 1,803 | 3,553 | 3,982 | 3,810 |
| Payable to Bureau of Delinquent Revenue (e) | 19,706 | 22,240 | 25,605 | 13,749 |

NOTES: (a) Includes administrative expense.

(b) Includes estimated cost of uncompleted work as of June 30, 1964.

(c) Includes only cases of current and previous year for which work was completed during the year.

(d) Includes installment payments on cases from previous years.

(e) Accounts are transferred to Bureau of Delinquent Revenue when:

1. Account is over 90 days old
2. Installment payments are made
3. Liability is denied
4. Responsible party is deceased or his whereabouts unknown

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1963-64

| <u>Location</u> | <u>No. of
Lights</u> | <u>Type of
Light (a)</u> | <u>Source of
Funds (b)</u> | <u>Value</u> |
|--|--------------------------|------------------------------|--------------------------------|------------------|
| Western Addition | 150 | M | DFW | \$ 84,610 |
| Post, Geary, and O'Farrell Sts. | 18 | M | DFW | 13,335 |
| Webster St. - Golden Gate to O'Farrell | 8 | M | DFW | 5,544 |
| McLaren Park | 20 | M | DFW | 15,734 |
| Melra Court | 2 | M | PO | 1,800 |
| Industrial Park | 6 | M | PO | 5,400 |
| Lombard St. - Van Ness to Hyde | 12 | M | DFW | 9,110 |
| Sunset Blvd. - Lake Merced to Lincoln | 198 | M | DFW | 126,679 |
| Hilton Hotel - Mason, Ellis, and
O'Farrell Sts. | 5 | M | PO | 5,900 |
| Federal Bldg. - Golden Gate, Larkin
and Polk Sts. | 32 | M | DFW | 38,387 |
| Telegraph Hill Blvd. | 33 | I | DFW | 31,656 |
| Produce Market - Jerrold and Rankin | 8 | M | DFW | 9,110 |
| Southern Freeway - Silver to Industrial | 8 | M | STATE | 4,000 |
| Thomas More Way | 4 | M | DFW | 5,943 |
| Francisco Heights | 24 | M | PO | 19,456 |
| Elmira Underpass | 5 | F | STATE | 2,000 |
| | <hr/> | | | <hr/> |
| TOTAL | <u>533</u> | | | <u>\$378,664</u> |

NOTES: (a) F - Fluorescent
I - Incandescent
M - Mercury Vapor

(b) DFW - Department of Public Works
PO - Property Owner

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

[illegible]

TABLE 16
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1963-64

| Contract No. | Description | Contractor | Contract Time | | Original Contract Price | Value of Work Done During Fiscal Year |
|--------------|---|---|---------------|-----------|-------------------------|---------------------------------------|
| | | | Started | Completed | | |
| HH-331 | Synchronous Generators Canyon Powerhouse | Ets-Hokin Corporation | 12-2-63 | --- | \$ 831,725 | --- |
| HH-349 | Canyon Power Tunnel | The Clancy M. O'Dell Construction Company | 1-8-62 | --- | 11,169,895 | \$ 3,990,347 |
| HH-355 | San Joaquin Pipeline No. 3 Section D-1 | Consolidated Western Steel Corporation | 9-17-62 | 9-13-63 | 1,447,316 | 1,440,418 |
| HH-356 | San Joaquin Pipeline No. 3 Section D-2 | Consolidated Western Steel Corporation | 9-17-62 | 9-13-63 | 1,651,147 | 1,637,139 |
| HH-357 | San Joaquin Pipeline No. 3 Section B | Kaiser Steel Corporation | 7-1-63 | --- | 6,603,992 | 5,256,210 |
| HH-358 | San Joaquin Pipeline No. 3 Connection To Tesla Manifold | Underground Construction Company | 8-19-63 | 3-7-64 | 132,817 | 128,974 |
| HH-361 | Sidewalks in Glen Park Canyon | Love and Haun | 9-9-63 | 10-8-63 | 1,570 | 1,593 |
| HH-362 | Tunnel Drain Line Canyon Powerhouse | Roy Madsen Construction Company | 10-7-63 | 2-20-64 | 54,437 | 59,654 |
| HH-364 | San Joaquin Pipeline No. 3 Section C | Healy Tibbitts Construction Company | 10-21-63 | --- | 1,516,835 | 936,551 |
| HH-365 | Replacement of Radio System | General Electric Communications | 7-22-63 | --- | 39,269 | 34,420 |

(Cont'd)

THE HISTORY OF THE

REPUBLIC OF THE UNITED STATES OF AMERICA

BY

JOHN F. JOHNSON

OF THE

UNITED STATES

OF AMERICA

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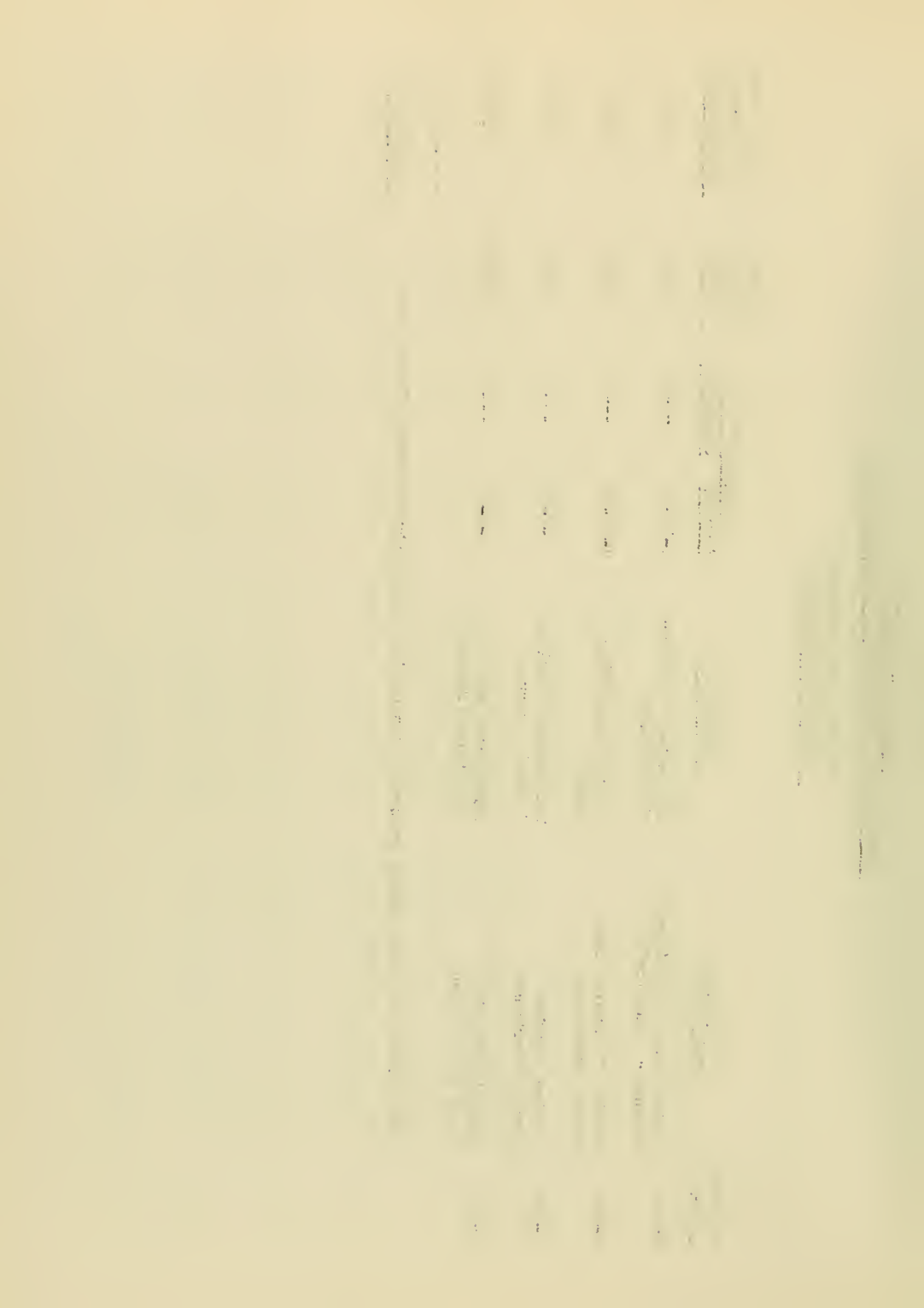


TABLE 17
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1963-64

| <u>Contract No.</u> | <u>Description</u> | <u>Contractor</u> | <u>Contract Time Started</u> | <u>Contract Time Completed</u> | <u>Original Contract Price</u> | <u>Value of Work Done During Fiscal Year</u> |
|---------------------|---|--|------------------------------|--------------------------------|--------------------------------|--|
| A-259 | South Terminal Apron Pavement & Facilities | L. C. Smith Company | 7-30-62 | 10-24-63 | \$ 1,600,025 | \$ 92,492 |
| A-260 | South Terminal Building and Piers | M & K Corp.-Stolte Inc. | 9-25-61 | 12-6-63 | 8,473,000 | 4,558,947 |
| A-285 | Pavement for Extension of Runway 28L | Fay Improvement & Fredrickson & Watson | 4-1-63 | 1-17-64 | 1,058,016 | 902,214 |
| A-297 | Elevated Roads & Ramps | M & K Corp.-Stolte Inc. | 5-14-62 | 11-15-63 | 540,851 | 109,467 |
| A-298 | Ground Level Road, So. Term. | Lowrie Paving Company | 10-15-62 | 10-2-63 | 181,799 | 53,883 |
| A-309 | Extension of Pier C | Pacific Coast Builders | 11-5-62 | 5-15-64 | 1,082,100 | 472,103 |
| A-314 | Relocation of Existing Parking Facilities | Lowrie Paving Company | 2-18-63 | 10-2-63 | 100,987 | 10,004 |
| A-323 | Additions Substas. A & E | Dahl-Beck Elect. Co. | 1-21-63 | 7-19-63 | 64,847 | 12,417 |
| A-324 | Traffic Control Gates Taxiway & Service Roads | Dahl-Beck Elect. Co. | 3-11-63 | 7-16-63 | 11,838 | 7,043 |
| A-328 | South Terminal, PA System | Communications Systems | 3-4-63 | 12-12-63 | 19,750 | 13,396 |
| A-331 | Parking Garage | Engstrom-Nourse & Massman Constr. Co. | 7-8-63 | --- | 7,459,000 | 3,542,790 |

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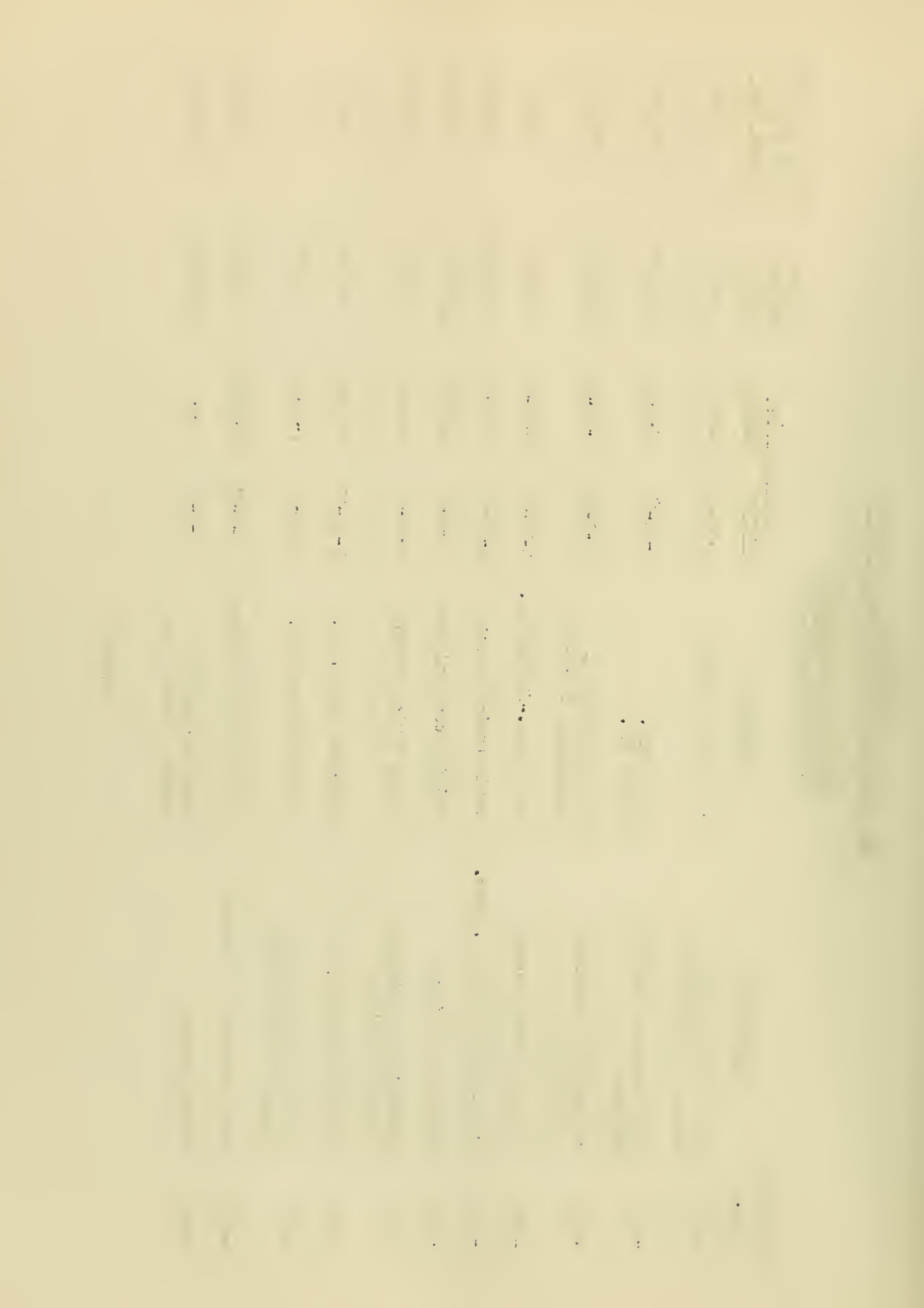


TABLE 17 - (Cont'd)
SAN FRANCISCO INTERNATIONAL AIRPORT

CONSTRUCTION CONTRACTS
FISCAL YEAR 1963-64

| Contract No. | Description | Contractor | Contract Time Started | Contract Time Completed | Original Contract Price | Value of Work Done During Fiscal Year |
|--------------|--|---------------------------------|-----------------------|-------------------------|-------------------------|---------------------------------------|
| A-332 | Road R-21 | Fay Improvement Co. | 6-3-63 | 11-15-63 | \$ 80,000 | \$ 70,396 |
| A-333 | Taxiway & Apron Pavement | Lowrie Paving Co. | 4-6-64 | --- | 731,635 | 273,822 |
| A-334 | Pavement Reconstruction Central Terminal Apron | Lowrie Paving Co. | 10-7-63 | 3-2-64 | 101,265 | 91,884 |
| A-342 | Automatic Flight Announcer South Terminal Building | Communications Systems | 5-27-63 | 10-23-63 | 54,052 | 52,052 |
| A-346 | Modifications, Power Sta. K | Bergesen Electric Co. | 7-15-63 | 12-30-63 | 4,963 | 4,963 |
| A-347 | Alterations to Pier C, Room G-20 | Francis W. Jones | 6-17-63 | 9-27-63 | 13,600 | 12,174 |
| A-349 | Additions to South Terminal and Piers | Wilner Construction Co. | 8-5-63 | 1-15-64 | 124,444 | 125,904 |
| A-351 | Surface Treatment | Golden Bear Oil Co. | 8-19-63 | 8-21-63 | 4,275 | 2,137 |
| A-352 | Fueling Facilities for Shuttle Buses | Roy Madsen Construction Company | 6-24-63 | 7-3-63 | 5,139 | 5,139 |
| A-353 | Pier F - Waiting Room, Gate 57 Interim Facilities & Elevator | Stenmark Construction Company | 10-21-63 | 3-18-64 | 146,641 | 146,176 |
| A-356 | Painting Central Terminal | A. Quandt & Sons | 9-2-63 | 11-15-63 | 15,447 | 15,447 |

(Cont'd)

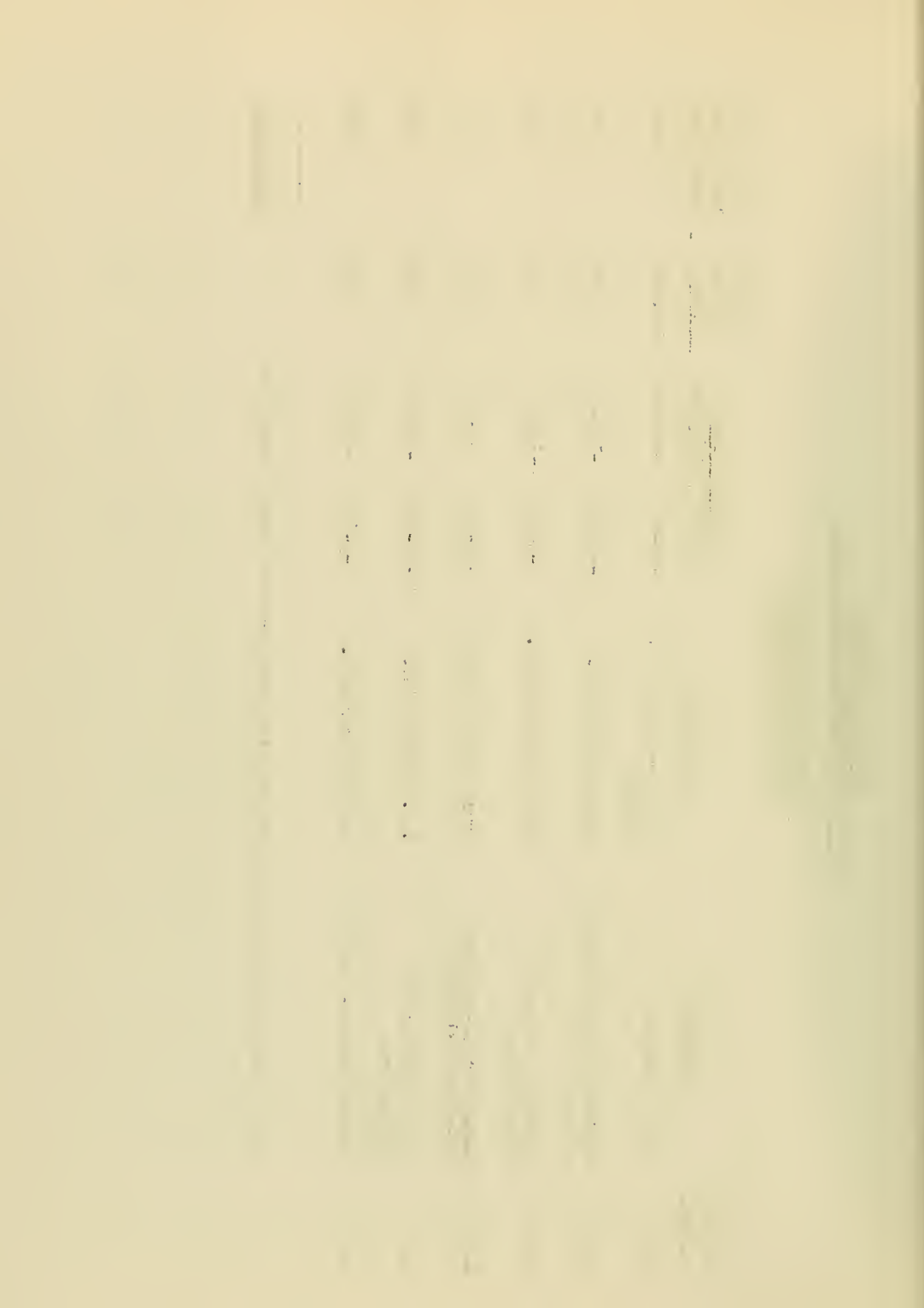


TABLE 18
MUNICIPAL RAILWAY

CONSTRUCTION CONTRACTS
FISCAL YEAR 1963-64

| Contract No. | Description | Contractor | Contract Time Started | Contract Time Completed | Original Contract Price | Value of Work Done During Fiscal Year |
|---|---|-------------------------|-----------------------|-------------------------|-------------------------|---------------------------------------|
| MR-474 | Track Removal & Construction Elkton Yard | Sharp & Fellows | 2-11-63 | 10-9-63 | \$ 74,146* | \$ 31,052 |
| MR-476 | Track Construction - Ocean Ave. at So. Freeway | Sharp & Fellows | 11-25-63 | 2-28-64 | 39,792* | 29,766 |
| MR-479 | Overhead Construction Elkton Yard | Abbett Electric Corp. | 9-30-63 | 4-8-64 | 28,990* | 20,086 |
| MR-480 | Relocation of Feeders-Temp. Detour, San Jose Ave. | West Coast Electric | 4-8-63 | 11-1-63 | 11,920* | 11,420 |
| MR-481 | Overhead Construction-Ocean Ave. at So. Freeway | Abbett Electric Corp. | 12-16-63 | 4-20-64 | 26,932* | 24,764 |
| MR-482 | Feeder Construction-San Jose Ave. at So. Freeway | Bay Area Electric Corp. | 4-6-64 | 5-21-64 | 9,780 | 9,780 |
| MR-487 | Radio System Replacement | General Electric Co. | 7-22-63 | --- | 30,637 | 4,960 |
| MR-488 | Re-roof Geneva Office | Regal Roofing Co. | 1-27-64 | 2-13-64 | 1,937 | 1,937 |
| MR-490 | Re-roof Potrero Carhouse | Western Roofing Co. | 5-11-64 | 6-30-64 | 9,557 | 9,557 |
| Total Amount of Municipal Railway Contract Construction Work Performed During Fiscal Year | | | | | | \$ 143,322 |

* Includes City-furnished materials

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* A P P E N D I X *
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HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU
AND
BUREAU OF LIGHT, HEAT AND POWER

ORGANIZATION AND PERSONNEL

O. L. Moore General Manager

Hetch Hetchy Project

Administration:
B. W. Grethel Assistant General Manager

Power Production:
R. E. Collins Senior Electrical Engineer

Water Production:
D. H. Matlock Senior Mechanical Engineer

Land and Water Resources:
R. Bei Senior Civil Engineer

Operations:
J. M. Woods Superintendent of Operations

Accounting:
W. J. Dwyer Chief Accountant

Utilities Engineering Bureau

Administration:
W. F. Getts Senior Civil Engineer

Planning:
J. L. Bardoff Senior Civil Engineer

Civil and Structural Engineering:
R. G. Lee Senior Civil Engineer

Electrical Engineering:
S. Yakahi Electrical Engineer

Mechanical Engineering:
B. D. Kong Associate Mechanical Engineer

Architectural:
S. F. Davis Senior Architect

Construction:
J. E. Parks Senior Construction Engineer

Bureau of Light, Heat and Power

Street Lighting and Utility Services:
L. R. Clark Electrical Engineer

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

ANNUAL REPORT
FISCAL YEAR 1964-65

WATER SUPPLY, POWER AND UTILITIES
ENGINEERING BUREAU
AND
BUREAU OF LIGHT, HEAT AND POWER

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

ANNUAL REPORT
FISCAL YEAR 1964-65

HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES
ENGINEERING BUREAU
AND
BUREAU OF LIGHT, HEAT AND POWER

O. L. MOORE
GENERAL MANAGER

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HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

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A P P E N D I X

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Hetch Hetchy Revenues and Expenditures
Hetch Hetchy Electric Energy - Generated and Purchased
Distribution of Hetch Hetchy Electric Energy
San Francisco Water and Power Systems - General Map
San Francisco International Airport - General Plan

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

HETCH HETCHY WATER SUPPLY
POWER AND UTILITIES ENGINEERING BUREAU
425 MASON STREET
SAN FRANCISCO, CALIFORNIA 94101
TELEPHONE 558-3821

August 31, 1965

Subject: ANNUAL REPORT
FISCAL YEAR 1964-65



Mr. James K. Carr
General Manager of Public Utilities
Public Utilities Commission
City and County of San Francisco

Dear Mr. Carr:

The Annual Report for fiscal year ending June 30, 1965, of Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau, and Bureau of Light, Heat and Power is respectfully submitted.

Approximately \$25 million in funds appropriated this fiscal year were administered for Department activities covering operation, maintenance, engineering, and construction. This amount is in addition to previously appropriated funds for construction under way or completed during the year.

Hetch Hetchy Project revenue from sale of water and power was \$15,362,243 compared to total operating expenditures of \$14,289,300. This total includes bond interest and redemption but excludes funds appropriated from revenue for the first phase of Moccasin Powerhouse replacement. Hetch Hetchy power for municipal purposes is furnished to City departments at cost -- 21 percent below commercial utility rates -- which amounted to a saving to taxpayers of \$745,369 for 1964-65.

At the beginning of the year, water storage in the mountain reservoirs was considerably below average due to 66 percent of normal runoff during the preceding year. This did not affect the water supply to San Francisco but did require curtailment of power generation, and the shutting down of Cherry Powerhouse during the months of October and December. After a series of heavy storms in December and January and heavy snow pack accumulated during the winter, normal power generation was resumed for the balance of the year. On June 30, storage in all three mountain reservoirs was at or approaching maximum capacity.

For Hetch Hetchy Project, San Francisco International Airport, and San Francisco Municipal Railway, 42 construction contracts were awarded for a total bid amount of about \$12 million. Value of construction work performed during the year was \$10.1 million with \$14.3 million under current contracts remaining to be completed. At year's end, plans and specifications for an additional \$15 million of work were being prepared.

On the Hetch Hetchy Project, a major element of the Canyon Power Development in the Sierra Nevada was completed -- the 10.5-mile, \$11 million power tunnel from O'Shaughnessy Dam to Early Intake. Contracts were awarded for the \$2.3

million connecting penstock and the \$4.3 million powerhouse which is scheduled to begin commercial operation in mid-1966. At an estimated cost of \$8.8 million, replacement of the existing 40-year old Moccasin Powerhouse was progressing with engineering under way, turbine purchase contract awarded, and generator bids advertised.

City's domestic water supply system was firmed up with additional aqueduct capacity from impounding reservoirs on the Tuolumne River watershed in the Sierra Nevada. The \$12 million, 34-mile section of the planned 47.5-mile Hetch Hetchy Aqueduct Pipeline No. 3, across San Joaquin Valley, was completed and placed in service. With this partially-completed third line, water diversion from the Tuolumne River watershed through the 140-mile system of tunnels and pipelines to the San Francisco Water Department, reached over two hundred million gallons daily for the first time in the history of the Hetch Hetchy Project.

San Francisco International Airport construction continued at a high level commensurate with record-breaking increases in passenger and cargo traffic. The \$8 million first-stage of the four-level parking structure, with initial capacity of 2,750 cars, was 90 percent complete at year's end. At a cost of \$1.5 million, Central Terminal building alterations were well along to reduce passenger congestion in ticketing and baggage claiming areas and to increase the overall efficiency of the facility. A \$500,000 fourth Air-Cargo Building and appurtenances, additions to the South Terminal building, and improvements to directional signs, taxiways, paving, utilities and miscellaneous facilities were completed or under way. Late in the year award was made for construction of \$700,000 Pier FF addition to the South Terminal.

At Municipal Railway's Washington-Mason cable car powerhouse, tired and antiquated cable driving machinery, in service since before the turn of the century, was replaced. Studies and surveys were conducted for necessary alterations, relocations and modified operations of Municipal Railway's facilities which will be required during construction of the Bay Area Rapid Transit System. The Department is participating in a Bay Area transit study, (two-thirds of which is financed by a federal grant) under the Northern California Transit Demonstration Project, a joint venture of Bay Area Rapid Transit District, San Francisco Municipal Railway, and Alameda-Contra Costa Transit District.

The street lighting modernization program in overhead districts, inaugurated in December, 1963, is two-thirds complete. Approximately 12,000 mercury-vapor units have been installed replacing obsolete incandescent lights. Expenditures for operation, maintenance, and repair of the street lighting system were \$1,075,748, an average of \$32.36 per unit. As of June 30, 1965, there were 33,239 street lights in service, an increase of 2,683 for the year.

The accomplishments recorded in this report were made possible by the loyalty and diligence of Department employees for which we wish to express the deepest appreciation.

Very truly yours,



O. L. MOORE
General Manager

ANNUAL REPORT

I. ORGANIZATION AND FUNCTIONS

HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU and BUREAU OF LIGHT, HEAT AND POWER, as a single unit under its General Manager, serves the City and County of San Francisco in the dual function of an operating department and a service bureau. Its policies are established by the San Francisco Public Utilities Commission and administered under the direction of the General Manager of Public Utilities.

Hetch Hetchy Water Supply and Power System, an operating unit, commonly known as Hetch Hetchy, encompasses a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed in California's Sierra Nevada and delivers it to the San Francisco Water Department. Approximately three-fourths of the water supplied in San Francisco and the Water Department service area comes from this source. Hetch Hetchy also operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy, a by-product of its major function.

The Utilities Engineering Bureau provides engineering services for Hetch Hetchy, San Francisco International Airport, and San Francisco Municipal Railway and is responsible for design and construction of all improvements for these utilities.

The Bureau of Light, Heat and Power is a service bureau. It arranges, under contracts, for furnishing electric, gas, and steam services to municipal departments and handles the monthly billing. It also supervises planning and improvements of street lighting furnished by Pacific Gas and Electric Company and administers contracts for street lighting operation and maintenance. Financing, design, and construction of City-owned street lighting improvements are under jurisdiction of Department of Public Works. In accordance with provisions of the City and County Charter and the Administrative Code, plans for these improvements must be approved by the Public Utilities Commission through this Bureau.

For fiscal year 1964-65, the Department administered budgeted funds for operation, maintenance, engineering, and construction as follows:

| <u>Budget</u> | <u>No. of Employees</u> | <u>Total Amount
Appropriated</u> |
|---------------------------------------|-------------------------|--------------------------------------|
| Hetch Hetchy Project | 116 | \$18,706,830 |
| Utilities Engineering Bureau | 161 | 1,768,975 |
| Bureau of Light, Heat and Power | 12 | 4,571,172 |
| 1955 Hetch Hetchy Power Bond Fund | -- | 525,040 * |
| 1956 Airport Bond Fund | -- | 265,567 * |
| 1961 Municipal Water System Bond Fund | -- | 241,735 * |
| 1962 Airport Bond Fund | -- | 184,462 * |
| | | <hr/> |
| | | \$26,263,781 |
| Less budget transfer duplications | | 1,666,684 |
| | <hr/> | <hr/> |
| TOTAL | 289 | \$24,597,097 |

* Does not include funds previously appropriated for construction under way or completed during fiscal year 1964-65.

II. HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

Description

San Francisco's primary source of water supply, pioneered by foresighted engineers more than half century ago, originates in the Hetch Hetchy development of the upper Tuolumne River watershed on the westerly slope of the Sierra Nevada, 150 miles east of San Francisco Bay. This supply supplements local sources in San Mateo, southern Alameda, and northern Santa Clara counties for domestic and industrial use within the City and County of San Francisco and its suburban area.

Electric energy is generated as a by-product of water operations and is conveyed to San Francisco over transmission lines of the City and of the Pacific Gas and Electric Company under a wheeling agreement. This power source supplies municipal functions which include water supply pumping stations, municipal airport, street transit system, street lighting, public building lighting, and miscellaneous loads. Electric energy is furnished also to two irrigation districts in the San Joaquin Valley to supplement generation of their own plants and, through facilities of Pacific Gas and Electric Company, to four industrial customers, two located in Santa Clara County, and two in Contra Costa County. Load requirements in excess of the City's Hetch Hetchy generation are supplied by power and energy purchased from Pacific Gas and Electric Company.

Hetch Hetchy Project is self-supported by revenue from electric power sales and from wholesale delivery of water to the San Francisco Water Department. In turn, the Water Department stores, transmits and distributes the water for sale to customers.

Operating properties of Hetch Hetchy water supply and power system are located in Tuolumne, Stanislaus, San Joaquin, and Alameda Counties. The water supply facilities include: eight dams with appurtenant impounding and regulating reservoirs and diversion works; 67 miles of tunnels; and 106 miles of aqueduct pipelines. The power system facilities include: three powerhouses, Moccasin-70,000 kilowatts, Cherry-135,000 kilowatts, and Intake-3,600 kilowatts (standby); 190 miles of high voltage transmission lines; substations and switchyards. These facilities also include electric distribution, telephone and radio communication systems for project use.

The power system is being expanded by construction of the second stage of the Canyon-Cherry Power Development financed from the \$54 million, 1955 Hetch Hetchy Power Bonds. The first stage, completed and placed in service in August, 1960, included Cherry Power Tunnel and Powerhouse, Intake Switchyard, Warnerville Substation, and the associated transmission system. The second stage, currently under construction, includes Canyon Power Tunnel, Canyon Powerhouse and appurtenant facilities.

A map showing Hetch Hetchy water supply and power system, together with San Francisco Water Department system, is included in the Appendix.

Revenue and Expenditures

Revenue from Hetch Hetchy Project operation is derived principally from two sources:

1. Wholesale delivery of water to San Francisco Water Department.
2. Sale of electric power and energy to San Francisco municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and four industrial customers---Kaiser Cement and Gypsum Corporation's (formerly Permanente Cement Company) cement plant and Kaiser Aluminum & Chemical Corporation's aluminum foil plant, in Santa Clara County; and chemical plants of Dow Chemical Company and Hercules Powder Company, in Contra Costa County.

Revenue from sale of water and for standby service to the San Francisco Water Department was \$4,500,000. Gross sales of electric energy amount to \$10,789,731, compared to \$10,794,462 during the year 1963-64. Increase in revenue from sales to the Modesto and Turlock Irrigation Districts, Dow Chemical Company, Kaiser Aluminum and Chemical Corporation, and municipal departments was offset by the reduction which resulted from reassignment of the Shell Chemical Company electric service contract to the Pacific Gas and Electric Company. Revenue from service orders, rentals, meals, and miscellaneous items was \$72,512.

Increase in electric power sales to Modesto Irrigation District in the San Joaquin Valley indicated continued load growth in that area. Revenue for electricity from City departments reflected a 7.7 percent growth, and 16.9 percent for the San Francisco International Airport in particular. Hetch Hetchy power is furnished to City departments at cost. For 1964-65, this represented a saving to the City of \$745,369, compared to the cost if supplied by the local investor-owned utility.

During the year, \$2,144,702 was expended for purchase of electric power and energy for resale, compared to \$833,313 in 1963-64. The increase was due principally to curtailment of generation at Cherry Powerhouse during the first half of the fiscal year necessitated by subnormal water conditions. However, a saving of \$140,998 from the budget estimate was realized because of favorable water conditions during the latter half of the year, which enabled the City to utilize its generating plants at maximum capability.

Service charges for transmission and distribution of Hetch Hetchy power over facilities of Pacific Gas and Electric Company exceeded the budget appropriation by \$4,283. This was due to increase in consumption by City departments over budget estimates.

Interest and redemption costs on outstanding Hetch Hetchy bonds for the year was \$7,519,835. Because of this heavy bond cost and the \$4,125,000 appropriated for replacement of Moccasin Powerhouse, total expenditures for the year exceeded total gross revenue by \$3,052,041, which was made up from unappropriated surplus.

Tables 1, 2 and 6 and a chart in the Appendix, show comparative data on receipts, expenditures, and sales of water and power from operation of Hetch Hetchy water supply and power system.

Taxes

Taxes for 1964-65 on utility properties under jurisdiction of Hetch Hetchy Project, located outside the City and County of San Francisco, were paid in the following amounts:

| <u>Tax-Levying Body</u> | <u>Assessed Value</u> | <u>Taxes Paid</u> |
|-------------------------------------|-----------------------|-------------------|
| Alameda County | \$ 1,650 | \$ 142.76 |
| San Joaquin County | 27,720 | 2,039.74 |
| San Mateo County | 1,330 | 124.60 |
| Stanislaus County | 65,370 | 5,318.36 |
| Tuolumne County | 3,372,160 (a) | 219,821.04 |
| Banta-Carbona Irrigation District | 3,192 | 137.26 |
| Modesto Irrigation District | 13,600 | 0.00 (b) |
| Oakdale Irrigation District | 12,320 | 862.40 |
| West Stanislaus Irrigation District | 1,800 | 99.00 |
| | | <hr/> |
| | TOTAL | \$228,545.16 |

(a) Includes \$3,000,000 assessment for water rights.

(b) Tax rate for fiscal year 1964-65 set at \$0.00.

Water Production and Transmission

After the previous extremely dry year, 1964-65 started as an excellent water year when heavy precipitation was received in December and January. Storms that caused flooding in other parts of the State deposited a substantial snow pack on the mountain watershed and deposited early runoff in the City's mountain reservoirs. Lake Lloyd and Lake Eleanor had been empty in early December and as a result of the available storage space were instrumental in the prevention of flooding on the lower Tuolumne River. There followed three months of low precipitation but with the substantial quantities deposited on the City's watershed in December and January, the year ended as an above-normal one with total runoff for the water year ending October 31, 1965 estimated at 133 percent of normal.

Lake Lloyd and Hetch Hetchy Reservoirs were operated in accordance with flood control criteria established under agreement with the Corps of Engineers, U. S. Army. At the beginning of the runoff period, a plan of controlled releases from Hetch Hetchy Reservoir was instituted to protect down-stream construction work at Canyon Powerhouse site. On June 30, 1965, Lake Eleanor was full and spilling, Lake Lloyd was nearly full and Hetch Hetchy Reservoir was expected to fill in July.

During the year, 54,708,400,000 gallons of water were diverted from Tuolumne River watershed through Hetch Hetchy Aqueduct for delivery to San Francisco Water Department. This represented 74 percent of the City's total customer consumption. In addition, 166,080,000 gallons were delivered to United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at Lawrence Radiation Laboratory at Livermore.

Table 3 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy water supply system.

Power System Operation

Due to subnormal runoff during the spring of 1964, power operation for the fiscal year began with less than full capacity storage in all of the mountain reservoirs. Moccasin Powerhouse was operated to maximum capability by utilizing carryover storage from the previous year. However, with storage at Lake Lloyd and Lake Eleanor at only 45 percent of capacity, power generation at Cherry Powerhouse was curtailed to reduce draft from storage.

Following a review of system load requirements and Hetch Hetchy generation capability, it was determined that a reduction in system load was advisable to keep purchased power and energy within budgeted funds. Therefore, effective July 1, 1964, under terms of the assignment agreement, the electric service contract for supplying Shell Chemical Plant at Pittsburg was reassigned to Pacific Gas and Electric Company.

Cherry Powerhouse was shut down on October 1 when Lake Lloyd storage was down to 25,000 acre-feet. However, in order to permit repairs to the lower slide gates on the outlet tower at Lake Lloyd before winter inflow, generation at the powerhouse was resumed in November to empty the reservoir by the first week of December. It was again shut down on December 3, 1964 when storage in Lake Lloyd was depleted, permitting the slide gate repairs. The powerhouse was returned to normal operation after heavy rains during the latter part of December refilled Lake Lloyd to almost 100,000 acre-feet. This early return to operation plus heavy snow pack during the winter producing substantial runoff in the spring, resulted in the expenditure for purchased power and energy to be \$140,998 below budget estimates.

Repairs to a burned-out bearing of Moccasin Powerhouse Generating Unit No. 3 necessitated a shutdown from October 14 to November 1, 1964. Although the resulting reduction in generating capacity increased purchased power costs by \$17,000, no increase in purchased energy was necessary since the remaining three units were operated to fully utilize the available water.

Beginning Sunday, March 14, 1965, water release from Hetch Hetchy Reservoir was shut off for six days to permit construction of a cofferdam in the Tuolumne River at the Canyon Powerhouse site. During the shutdown, a limited generation schedule was placed in effect at Moccasin Powerhouse so that minimum required water diversion to the San Francisco Water Department was maintained from storage in Priest Reservoir which had been built up to maximum capacity prior to shutdown. Although some deficiency in power occurred, the reduction in energy generation at Moccasin Powerhouse was offset by increased generation at Cherry Powerhouse.

During the shutoff of water for construction of the cofferdam, inspections were made of the 19-mile Mountain Tunnel from Early Intake to Priest Reservoir and of the one-mile Moccasin Power Tunnel from Priest Reservoir to the head of Moccasin Powerhouse penstocks. Both tunnels have been in service for forty years and these inspections were the first to have been made since 1950 and 1941 respectively. The tunnels are in good condition with no rock falls of any consequence in the unlined sections. The concrete lining is in excellent condition except in the areas immediately upstream and downstream from the 225-foot, 114-inch diameter, exposed steel pipe section crossing the South Fork of the Tuolumne River.

Reconstruction of this tunnel section including the pipe crossing, which is vulnerable to damage from falling rocks off the high cliffs above, is included in the Department's Capital Improvement Program.

Tables 4 to 7 inclusive and charts in the Appendix, show comparative operating statistics for the Hetch Hetchy power system.

Improvements To Operating Properties

During the year a debris deflector was constructed on Moccasin Creek, upstream from Moccasin Upper Dam, to catch brush, trees and other floating debris carried down during flash runoffs. In the past, this debris has blocked the conduit bypassing Moccasin Re-regulating Reservoir, causing polluted and silt-laden water to spill into the reservoir, requiring cessation of deliveries to San Francisco for domestic supply.

The inlet channel of Eleanor-Cherry diversion tunnel was deepened and, at the same time, the tunnel inlet structure, temporarily modified to alleviate tunnel silting, was reconstructed on a permanent basis. The channel change will permit diversion of additional water from Lake Eleanor to Lake Lloyd for power generation at Cherry Powerhouse.

Obsolete radio equipment at the five snow survey cabins was replaced, thus completing all work under the project's radio system replacement program.

Reconditioning, including painting, of 31 steel towers on the Moccasin-Newark transmission line was completed.

Moccasin-Newark transmission line Tower No. 958 in the City of Fremont was relocated in order to maintain the proper clearance between the City's line and a new transmission line constructed by the Pacific Gas and Electric Company. The work was performed by and at the expense of the Company.

Miscellaneous improvements include replacement of a portion of the 4-inch domestic water system line at Moccasin Headquarters; installation of chain link fencing at Moccasin and Alameda East Portal; and construction of a permanent service platform at Cherry Powerhouse to facilitate servicing the vertical lift door operating mechanism.

A new motor grader was purchased to replace one purchased in 1948. This equipment will facilitate maintenance and snow removal on project roads.

Moccasin Powerhouse

Following recommendations of the project planning report, prepared by Sverdrup & Parcel And Associates, consulting engineers, it was decided to replace the existing 40-year old Moccasin Powerhouse. The new plant, to be adjacent to the present one, will be an outdoor type with an initial installation of two 45,000-kilowatt hydroelectric generators utilizing the existing penstocks. The total estimated cost is \$8,830,000.

During the year, Sverdrup & Parcel And Associates was engaged to prepare working drawings, specifications and cost estimates. Foundation studies and test borings at the site were completed. A purchase contract was awarded for furnishing the impulse turbines, governors, turbine shutoff valves and bypass valves at a cost of \$1,211,400. At year's end, bids were advertised for furnishing the generators at an estimated cost of \$1,000,000. Completion of the new plant is scheduled for early 1968.

R. W. Beck And Associates, consulting engineers, was employed to perform preliminary studies and analyses relative to increasing the installed capacity over that presently contemplated in the new Moccasin plant. These studies will explore engineering possibilities and economic feasibility of developing further peaking capacity.

Canyon Power Project

Construction continued on the second phase of the \$54 million Hetch Hetchy power system expansion program, authorized by the electorate of San Francisco in 1955. The first phase was completed in 1960 when Cherry Powerhouse and related transmission system was placed in operation.

The Canyon Power Project will utilize the City's domestic water supply for power generation by passing water from Hetch Hetchy Reservoir through a 10.5-mile pressure tunnel to Early Intake where it will drop 1,370 feet through a penstock to Canyon Powerhouse. At this point, the falling water will drive two hydro-electric generators having a total nameplate capacity of 67,500 kilowatts. After passing through the powerhouse, the water will bypass Early Intake Diversion Dam through a tunnel and conduit directly into the 19-mile Mountain Tunnel. This tunnel, in operation since 1925, delivers the water to Moccasin Powerhouse, utilizing a second drop for power generation as the water flows on its way through the Hetch Hetchy Aqueduct to San Francisco.

Work was completed on the \$11 million, 10.5-mile Canyon Power Tunnel, under construction since January, 1963. The tunnel, 14 x 14.5-foot horseshoe section, is unlined, except where ground conditions require concrete lining and where steel lining is needed to resist internal pressure adjacent to tunnel portals.

A \$4.3 million contract was awarded for construction of the powerhouse including installation of the turbines, governors and large valves purchased at a cost of \$1,038,000 under a separate contract. The generators and related equipment are being furnished and installed under another contract at a cost of \$842,400. At year's end, excavation of the powerhouse foundation was completed and concrete was first poured on June 17. Excavation of the 1,600-foot bypass tunnel was approximately 45 percent complete.

In May, the last of the major contracts for this project was awarded in the amount of \$2.3 million for furnishing and installing 2,130 feet of 92-inch, 84-inch and 66-inch diameter steel penstock pipe. The contract also includes construction of a valve house, installation of a 98-inch diameter butterfly valve, and construction of concrete anchors. A unique engineering feature is the use of prestressed steel "tendons" drilled into bedrock to hold down the anchors and pipe sections on the steep hillside.

Canyon Powerhouse is scheduled to be in commercial service by mid-1966.

San Joaquin Pipeline No. 3

The City's domestic water supply system was firmed up with additional aqueduct capacity from impounding reservoirs on the Tuolumne River watershed in the Sierra Nevada. A \$12 million, 34-mile section of the planned 47.5-mile Hetch Hetchy Aqueduct Pipeline No. 3, across San Joaquin Valley was placed in operation. This line, consisting of 6-1/2 foot diameter coal-tar enamel coated steel pipe with coal-tar enamel or cement-mortar lining, supplements the first and second lines placed in service in 1934 and 1952 having capacities of 70 and 90 million gallons per day respectively. On June 30, 1965, with the partially-completed third line, water diversion from the Tuolumne River watershed through the 140-mile system of tunnels and pipelines to the San Francisco service area, reached a rate of 220 million gallons a day, over two hundred million for the first time in the history of the Hetch Hetchy Project.

The completed portion of the third pipeline lies between the meter house at Albers Road south of Oakdale (where connection is made to Lines No. 1 and 2) and Tesla Portal of the Coast Range Tunnel. The line, constructed under five separate contracts, was laid in trenches across the San Joaquin Valley under earth, water, railroads and highways within the previously purchased Hetch Hetchy Aqueduct right-of-way. The San Joaquin River crossing, which includes an emergency discharge valve and vault, consists of approximately one mile of cement-mortar lined steel pipe with reinforced concrete jacket. The pipe is laid under the river bed on concrete saddles supported by over 1,000 timber piles. Construction of the river crossing required a steel sheet piling cofferdam and a temporary detour for State Highway 132.

Plans are under way for construction of the remaining 13-1/2 miles of No. 3 pipeline, in the foothills of the Sierra Nevada, scheduled for completion in 1968. This will increase the adequate capacity to 295 million gallons daily, estimated to be sufficient for San Francisco's requirements until 1985. The total estimated cost of \$22 million for the full length of the third line is being financed from the Municipal Water System Bonds approved by the electorate in 1961 by a vote of more than 11 to 1.

At year's end, plans were under way for modifications and relocations of the City's three San Joaquin pipelines at the proposed crossing of the 146-foot wide canal of the State's California Aqueduct, seven miles south of Tracy, and at four proposed new freeway crossings. The work, estimated to cost \$400,000 and \$2,000,000 respectively, will be done at State's expense.

Status of Hetch Hetchy Construction Contracts

A summary of Hetch Hetchy construction contracts in progress during fiscal year 1964-65 is shown in Table 16.

New Don Pedro Project

On a cooperative basis, the City and County of San Francisco, Turlock and Modesto Irrigation Districts, and Corps of Engineers, U. S. Army, have agreed to further develop the Tuolumne River watershed by providing additional storage capacity.

This is to be accomplished by the Districts' construction of a new dam about one and one-half miles downstream from their present Don Pedro Dam. The City's participation in this project was authorized by electorate approval of the 1961 Municipal Water System Bond Issue.

The new dam will be earth and rock fill approximately 580 feet high and 800 feet long, with concrete spillways and a storage capacity of 2,030,000 acre-feet, seven times that of the present reservoir. The dam will provide necessary increase in storage space for the City and will also provide additional storage space for irrigation and power generation for the Irrigation Districts. Further, it will augment flood control space for the Corps of Engineers in its program for protection of the lower Tuolumne River from flood damage. The increase in storage capacity will enable San Francisco to meet the estimated water requirements of the City and its service area at least for the remainder of this century.

The two Irrigation Districts will furnish the damsite and the lands which will be covered by the new reservoir. The City of San Francisco and the federal government propose to pay an estimated \$42 million and \$5.4 million respectively toward the cost of the dam.

Since 1962, the Project has been hampered by a series of legal maneuverings on the part of the State of California and the federal government to impose unreasonable requirements for water releases for fish enhancement on the Project. Action on the Districts' application to the Federal Power Commission for a license to construct and operate the New Don Pedro Project has been delayed by hearings, initial decision of the FPC examiner, and exceptions filed by the Districts, California Department of Fish and Game, U. S. Department of the Interior and Federal Power Commission staff. After thorough study and review of all evidence presented, on March 10, 1964, the FPC distributed its opinion and order issuing a license for the Project. Essentially, the license was for a 50-year period but in the matter of water releases for fish life the FPC required a release schedule only for the first 20 years of Project operation. The order stated that during this period studies were to be conducted by all parties involved to determine the needs for fish releases. At the end of this period, the FPC would determine whether the releases should be continued, curtailed or eliminated.

Following issuance of the order, all parties filed applications for rehearing. On May 6, 1964, the FPC denied the applications but did clarify its position that fish releases were not to interfere with the primary purposes of the Project. Districts were then allowed 60 days in which to accept the license.

On July 3, 1964, the State of California, acting on behalf of the Department of Fish and Game, filed suit in Federal Ninth Circuit Court of Appeals, petitioning the Court to require the FPC to review the portion of its order pertaining to fish water releases below the proposed dam and to receive additional evidence. On July 6, 1964, the U. S. Department of the Interior also filed a similar suit in the Federal Court. The Districts, anticipating such moves, and to protect their interests, also filed suit on July 6 in the same court.

During the fall and winter of 1964-65 legal briefs were filed by all parties. Oral arguments were heard on March 9, 1965. On May 18, 1965, the Court issued

its opinion that the FPC had acted in proper manner and upheld the terms of the FPC license as issued. The Districts, within the 30 days allowed, filed a petition for rehearing which the Court turned down on June 28, 1965.

At the end of the fiscal year, petition to the U. S. Supreme Court within the 90 days allowed, was under consideration by all parties.

Antitrust Actions

The City and County of San Francisco is prosecuting eleven antitrust actions in the United States District Court for the Northern District of California. These suits are against manufacturers of electrical equipment sold to the City and County in the amount of \$11 million, alleging conspiracies consisting of artificial price-fixing and collusive-bidding activities, in violation of the antitrust laws. A suit also has been filed against manufacturers of high pressure steel and concrete water pipe, of which the sales to the City and County amounted to \$20 million.

Considerable work was done during the year in detailed research of files, particularly on electrical purchases subsequent to 1948. Proposed formal answers were prepared for the City Attorney and necessary supporting documents were furnished to him for the numerous defendants' interrogatories pursuant to national pre-trial orders.

With the consideration that further actions for damages may be instituted, the City Attorney was furnished information regarding the Department's purchases of aluminum conductor cable, asbestos cement pipe, and various chemicals.

Moccasin School

After nearly 40 years in service, the one-room elementary school at the Moccasin operating headquarters was closed. Consolidation of school districts resulted in transfer of the students and the one teacher to the Big Oak Flat-Groveland area. The school building was originally constructed by the City to provide facilities for children of City employees working in the then relatively isolated area. In recent years, the school also served children from the nearby Moccasin State Fish Hatchery. At one time there were as many as 32 students enrolled in the eight grades in two sessions with two teachers assigned.

III. AIRPORT ENGINEERING AND CONSTRUCTION

General

Improvements to San Francisco International Airport continued to be the major work load for the Utilities Engineering Bureau during the fiscal year. Our major project was the nearly completed parking garage in the terminal complex. Good progress was made on the major change in interior appearance and functioning of the Central Terminal building. Continued additions to the South Terminal building and Piers improved operations with added convenience to the public. A fourth air cargo building is rising to meet the need of additional space for air freight handling. New taxiways and apron pavement were added to the landing field. Electric service capacity to the Airport is being increased and distribution facilities within the Airport are being extended. These and other facilities were planned, designed, and constructed with funds from the \$25 million Airport bond issue of 1956, the \$9.8 million Airport bond issue of 1962, and Airport operating revenues.

A general plan of San Francisco International Airport is included in the Appendix.

Construction Progress

The Central Terminal building is undergoing a major interior renovation which was three-quarters complete at year's end. These improvements were designed to meet the requirements of the "New Era Airport" by providing the airline tenants and the public with facilities comparable to those of the new South Terminal. Extensive remodeling of walls, floors, ceilings, equipment, and utilities in public areas will provide a new first floor ticket lobby, a new waiting room on the second floor, additional and improved baggage conveying facilities on the ground floor, an additional elevator serving the first, second, and third floors, and new signs throughout the areas. The City's work is being done concurrently with remodeling of lease areas by airlines and concessionnaires occupying the building.

Although most of the work in the Central Terminal is being done under a \$1.2 million contract, other contracts were let to augment the work. Four separate outbound conveyor systems on the south side of the building were being installed from the ticket counters of four airlines to the baggage make-up area on the ground floor. Two rotary baggage dispensers were installed and an existing dispenser relocated in the north baggage claiming area on the ground floor. Identification and operational signs were installed on the north side of the ground floor and first floor. The flight announcing system is being modernized with new record changer consoles, and by the installation of a priority and control scheme for the entire public address system.

The two 460-foot parallel moving sidewalks built into the concourse between Piers B and C on a rental basis, performed satisfactorily during a one-year experimental period ending May, 1965, and were approved by the City for purchase.

During the year, additions to the South Terminal building and Piers E, F, and G, included floor covering in Piers F and G; installation of additional controls for heating, ventilating, and boiler room operation; and improved car rental facilities in the building, courts, and under the elevated roadway.

The South Terminal Complex configuration was a step nearer completion with the start of construction of Pier FF. The upper level of the pier will provide gaterroom areas for five domestic aircraft loading positions, all using "jetway" type aircraft loaders. The lower level will be used for airline operations and office facilities.

The first stage of the four-level parking garage is being rushed to completion, with opening scheduled for October, 1965. The garage, which has been under construction for two years, will house 2,750 automobiles in this first of three stages. The centrally-located facility provides convenient access to the two terminal buildings via two pedestrian tunnel concourses and a vehicle bridge to the upper level road. Under separate contracts, twelve moving ramps and four moving walks are being installed in the garage and in the pedestrian tunnels to carry passengers to all levels. A complete exterior signing system for public guidance is being installed on the roads and ramps leading to the parking structure and terminal buildings.

Supplementary parking for approximately 800 automobiles was provided upon completion of pavement and lighting for Parking Area B. Asphaltic overlay pavement was placed on the deteriorating surface of Parking Area No. 2, and the area lighting was doubled by the installation of color-corrected, mercury-vapor lights.

Air Cargo Building No. 4, similar to Buildings No. 2 and 3, was over one-third complete at year's end. The 120-foot by 220-foot modified pre-fabricated building will provide sorely needed space to handle rapidly increasing air freight traffic. The work included relocation of existing tenant facilities to clear the site. Pavement and utilities to service the building were nearing completion under a separate contract.

On the field side of the terminal buildings, a concrete pad for aircraft parking was constructed at Pier E. Ten-foot high blast fences, stepped down to 4-foot height at ends of sections, were installed around the perimeter of the terminal apron for protection of the public and operating personnel. Back panels were placed on the public side of the blast fences for better appearance. Pavement, fire lines, and lighting were installed for fuel truck parking near Plot 3.

Several important improvements to the landing field were completed. An additional 2,100-foot length of Taxiway G, east of and parallel to Runway 1R-19L, provides supplemental aircraft access between the South Terminal area and Runways 28L and 28R. A high speed exit taxiway enables incoming aircraft to quickly vacate Runway 28L. A South Terminal apron extension was constructed to accommodate Pier FF. Deteriorated portions of Taxiway S and the central 60-feet of Runway 10L-28R were restored to structural soundness and smoothness by excavation and replacement with new bituminous pavement and overlay. An existing hump at the south end of Runway 1R and adjacent taxiway, caused by the old Bayshore Highway crossing in that location, was corrected with bituminous overlay pavement. A 5-kv air circuit breaker was installed in Power Station G for the Federal Aviation Agency field power circuits.

At the former Pan-American Maintenance Base, alterations and additions to the existing heating systems were in progress under two contracts, one for buildings presently occupied and one for buildings to be occupied in the future. The work involves conversion from steam to hot water heating, supplemented with electric heating in certain areas.

Major improvements to the Airport's electric service to increase both capacity and reliability, commenced in May, 1965. New 12-kv service feeders from Millbrae substation will increase Airport capacity by 100%, and a new cable from substation C will increase capacity for Piers B, C, and D by 50%. Under another contract, the electrical distribution system was extended to the lease areas along Roads R-3 and R-6 by installing three power stations and a 12-kv feeder cable to service the plots. A City-furnished 225-kva distribution transformer was installed to increase electrical service to the United States Coast Guard facility.

A variety of additions and modifications to the water and sewerage systems in the terminal area were well underway. These improvements will increase the operational effectiveness and reliability of the systems.

Interim facilities were under construction to improve the quality of industrial waste effluent being discharged into the Bay at the Airport. The project comprises a 17-acre oxidation pond for the detention of industrial and drainage wastes, which will be pumped from the existing drainage canal.

Pending award at the end of the year was a contract for re-roofing the portion of Pier C which lies between the Central Terminal building and the hexagon addition constructed in 1963. A contract covering pavement reconstruction of Taxiways A, D, E, F, and the apron for Runway 10L was advertised.

Status of Airport Construction Contracts

A summary of the Airport construction contracts in progress during the fiscal year 1964-1965 is shown in Table 17.

Planning For Future Development

Engineering work required for Federal Aid Airport Program Project 9-04-034-C522 was completed after the Federal Aviation Agency had tentatively allocated \$675,000 towards the cost of the project. The construction will implement the master plan for the east-west runways by providing, in cooperation with the FAA, a complete instrument landing approach light system for Runway 10R-28L. The City will remove obstructions, extend Runway 10R-28L westerly from 9,500 feet to 10,600 feet total length, install in-runway lights, and provide a timber trestle in the Bay waters and other facilities which will permit conversion of this runway to Category II status. Upon completion of this work and the appurtenant installation of an instrument landing system waveguide localizer and approach light system by the FAA, Runway 28L will become operable as an instrument runway. This in turn will permit the future extension of parallel Runway 28R, under Federal Aid Airport Program Project C-421.

Other work contemplated under the Federal Aid Project includes the pavement reconstruction of portions of Runway 28L and Taxiways A, B, and F, and the construction of an aircraft parking and servicing apron for general aviation use. Application for federal aid involved the preparation of plans, specifications, and an engineering report.

A request for federal aid was prepared also for landing field pavement reconstruction, and advance planning and engineering funds for fiscal year 1966-67. Advance funds are being made available under an amendment to the Federal Airport Act.

The first of a series of contracts which will result in the extension of Runway 10R was ready for advertising. This is for alterations to Hangar No. 4 for conversion into a firehouse, made necessary because the present facility is in a building scheduled for removal from the clear zone of extended Runway 10R.

Plans and specifications were nearing completion for: the extension of Taxiway R to serve additional maintenance base areas; additional baggage conveyors and carousels in the South Terminal building; improvements to Piers C and D; and directional, identification, and operational signs in the Central Terminal building.

Well under way were plans and specifications for the construction of Drainage Pumping Plant No. 3 at the junction of the South Lomita and Millbrae canals, and the relocation of the Construction Office and the Maintenance Yard to the former Pan-American Base.

Other improvements, either under study or in the preliminary stages include: a two-level parking structure in the Southeast Court for approximately 150 automobiles; fencing and landscaping for Parking Area No. 2; reconstruction or improvement of sidewalks at both terminal buildings; the construction of Room 16-2 in Pier FF; painting of Pier FF interim facility; pavement overlay for perimeter roads; sewage and drainage pipelines replacement; and a service road for the terminal apron.

Impetus was given towards updating the Airport Master Plan and providing for the long-range development of the Airport by Public Utilities Commission's approval for the engagement of an architectural-engineering team. The Department's staff will assist the consultants in performing the necessary research and planning. The study will embrace the runway system, a third terminal building, an air cargo center, automobile parking, general aviation, maintenance facilities, roadway systems, landscaping, and aesthetic improvements.

Miscellaneous Engineering

Airport engineering work involved a broad spectrum of other activities.

Staff members, together with Airport Management, attended conferences in July with airport operators and aircraft manufacturers in Seattle and Burbank on planning for the proposed use of supersonic aircraft. Later in the year, the Department reviewed the compatibility of the Lockheed 2000 and the Boeing 733-290 aircraft with present airports. These aircraft are considerably

longer and heavier than the largest subsonic jets now in service. The salient points studied were pavement strength requirements and ground maneuvering of the aircraft.

In cooperation with the State Regional Water Pollution Board, a program to monitor industrial waste effluent from the Airport was conducted, and individual tenant's wastes were tested. Surveys were taken also of tenant operations which involve industrial wastes. Studies were under way to develop an ultimate solution for preventing harmful effluent from entering Bay waters.

Discussions continued with the City of Millbrae on improvement of the Millbrae canal drainage system. An agreement was being prepared under which the City will build a pumping plant to lift drainage from the South Lomita canal into the high level canal being built by Millbrae through Airport property. Meetings were held also with San Mateo County and local jurisdictions within the county concerning the formation of San Bruno Creek Flood Control District and proposed improvements therein.

The Department explored many possible alternatives for the establishment of a heliport in or near downtown San Francisco. A location on the Bay side of the Ferry Building was chosen from among 12 proposed sites. Means of providing either temporary or permanent facilities were investigated. Because of State and Bay Area Rapid Transit plans affecting the area, the studies were narrowed to the use of a borrowed Navy barge as a temporary floating heliport to be moored near the wharf adjacent to the Ferry Building. The studies involved discussions with Federal Aviation Agency, United States Navy, State's San Francisco Port Authority, and SFO Helicopters.

Technical assistance was given to various Airport tenants in developing plans for improvements. All construction plans of tenants were checked and all actual construction inspected. The proposed regulations governing these activities were revised and expanded to cover rent credit arrangements. Lease drawings for Airport tenants were prepared as required.

Other activities during the year included: drafting a proposed lease for operation of the parking garage; scheduling of improvements to be constructed with funds from a proposed bond issue; developing further a map showing flight height requirements for areas near the Airport; investigating improved lighting for parking lots and streets; and studying proposed landscaping for the Northwest Court.

Financing

By June 30, 1965, \$30,987,000 had been spent under the \$25 million 1956 Airport bond program which has been supplemented by Federal aid and other sources of over \$6,000,000 for the development of the Airport. An additional \$8,396,000 was spent under the \$9.8 million 1962 Airport bond issue for the first stage of the multilevel parking garage.

During the year, funds for construction were appropriated from Airport revenue as follows:

| | |
|--|-------------|
| Improvement of Runway 10R-28L and taxiways | \$1,325,000 |
| Additional improvements, Pier FF, South Terminal | 280,000 |
| Baggage handling facilities, South Terminal | 128,000 |
| Improvement of existing auto parking facilities | 93,000 |
| Aircraft traffic control at runway-taxiway intersections | 20,000 |

Through the Federal Aviation Agency, the federal government tentatively allocated \$675,000 to the City as its participating share in the westerly extension of Runway 10R to 10,600 feet and all improvements necessary for conversion to an instrument runway. This allocation also covered certain pavement reconstruction and the construction of a general aviation parking apron. During the year, funds totaling \$914,318 were received from the Federal Aviation Agency for construction work completed under approved grants.

Taxes

The following tabulation shows taxable land area, assessed valuation, and taxes paid for the San Francisco International Airport property in San Mateo County for the fiscal year 1964-65 as compared with the two previous years:

| | <u>1962-63</u> | <u>1963-64</u> | <u>1964-65</u> |
|----------------------------|----------------|----------------|----------------|
| Total Taxable Area (acres) | 4,947.14 | 4,947.14 | 4,947.14 |
| Total Assessed Value | \$1,197,430 | \$3,425,225 | \$3,373,495 |
| Total Amount Taxes Paid | \$ 94,254 | \$ 266,193 | \$ 278,032 |

The above tabulation includes taxes imposed by San Mateo County and the Cities of South San Francisco, San Bruno, San Mateo, Burlingame and Millbrae.

IV. MUNICIPAL RAILWAY ENGINEERING AND CONSTRUCTION

General

During the year, work on replacement of equipment for the Radio Communications Center on Twin Peaks and the reconstruction of the cable winding machinery at Washington-Mason Cable Car Powerhouse was completed. Design and preparation of plans for rehabilitation of Railway properties continued.

Construction work during the fiscal year was financed from the Municipal Railway Operating Fund and the Municipal Railway Reconstruction and Replacement Fund.

Replacement Of Radio System

In order to bring the mobile radio system up to standards required by the Federal Communications Commission, work was completed on replacement of the equipment at the Radio Communications Center on Twin Peaks and in mobile stations. Initially, interference caused by multiplicity of radio installations at the communications center prevented satisfactory operation on the proposed frequency of 44.58 megacycles. Extensive field tests established that the original operating frequency of 31.14 megacycles is optimum. Authorization by the Federal Communication Commission to use the original operating frequency enabled completion of the work and has resulted in satisfactory operation of the system.

Cable Winding Machinery

After eighty years of operation, the cable winding machinery in Washington-Mason Powerhouse for San Francisco's cable car system was replaced. The machinery consists of: herringbone gear train, winder sheaves, pillow blocks and shafts. The time of the cable car shutdown required for replacement of the winding machinery was also utilized for extensive track repairs and replacement of worn cable sheaves along the several cable lines.

Plans and specifications for a visitors' facility to view the cable winding operation and related machinery were in progress at the end of the year.

Geneva Avenue Feeders

Relocation of railway power feeders required by the widening of Geneva Avenue by the Department of Public Works was completed.

Buildings

Reroofing of the Bryant and Division Storeroom was completed. At year's end, replacement of gutters and downspouts at 24th and Utah Garage was in progress and contracts for the following work had been awarded: Alterations to Room "A", 949 Presidio Avenue; roof repairs, Turk Street Substation; protective shelter, Outer Mission Substation; and reroofing, Geary Carhouse and offices.

Status Of Municipal Railway Construction Contracts

A summary of Municipal Railway construction contracts in progress during fiscal year 1964-65 is shown in Table 18.

Rapid Transit

Continued conferences were held with representatives of San Francisco Bay Area Rapid Transit District. Station plans were examined with reference to station entrances and internal configurations, as related to Municipal Railway passenger movements. Plans showing methods of construction for maintaining Municipal Railway service on Market Street were reviewed. The temporary detouring of Railway routes during the construction of the subway along Mission Street from Otis Street to Randall Street was also studied.

Northern California Transit Demonstration Project, a joint venture of Bay Area Rapid Transit District, San Francisco Municipal Railway, and Alameda-Contra Costa Transit District, commenced operations under the guidance of a Board of Control consisting of James K. Carr, General Manager of San Francisco Public Utilities Commission, B. R. Stokes, General Manager of Bay Area Rapid Transit District, and K. F. Hensel, General Manager of Alameda-Contra Costa Transit District. The Board has appointed E. Sam Davis its Project Manager. Consultants were selected for the various phases of work to be undertaken. The work is partially financed by a grant from the Housing and Home Finance Agency of the federal government.

The primary objective of this project is to study the impact that the construction of the Bay Area Rapid Transit System will have upon the San Francisco Municipal Railway and to devise a program that will enable the Railway to serve the people of San Francisco with the finest transportation system possible. The results of this study will be made available during the coming year.

V. STREET LIGHTING

General

The lighting of public streets within the City of San Francisco is provided by facilities in part owned by the City, part furnished by Pacific Gas and Electric Company, and the remainder jointly owned.

During the fiscal year 1964-65, maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Department. A second contract covered work required for repair of defective and damaged equipment, painting, and miscellaneous maintenance.

Under contract, Pacific Gas and Electric Company furnished street lighting service as directed, including maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement of individual lamps and globes, and emergency work required during other than normal working hours.

Electric energy for all City and Company-owned street lighting operation was supplied by the City's Hetch Hetchy electric power system.

Improvements and additions to lighting in overhead and underground districts continued. Plans were prepared by Bureau of Engineering, Department of Public Works, for rehabilitation of Company-owned lighting in overhead districts, for City-owned facilities in connection with street improvement and undergrounding projects, and for improvements under the 1964 Street Lighting Bond Issue. These plans are submitted to the Public Utilities Commission through the Bureau of Light, Heat and Power for review and approval.

Operation and Maintenance

As of June 30, 1965, a total of 33,239 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, tunnels, and underpasses, an increase of 2,683 during the year. The increase, in major part, resulted from the program for modernization of Company-owned lighting in overhead districts. Improvements and additions to City-owned systems in underground districts also contributed to the increase. A summary of the number and types of units in service at the end of the fiscal year is shown in Table 11.

A total of \$1,075,748 was expended for operation, maintenance, and repair of the street lighting system. The year's cost per unit averaged \$32.36. Of the total cost, \$11,736 was paid by the State for its share of operation and maintenance of street lighting at intersections on City streets which are part of the State highway system.

A summary of expenditures for operation and maintenance of street lighting for the fiscal year is shown in Table 12.

Improvements

The program, inaugurated in December, 1963, by the Pacific Gas and Electric Company for modernizing Company-owned street lighting in overhead districts was two-thirds complete on June 30, with approximately 12,000 mercury-vapor units installed. The advances in the technology of mercury-vapor lights have made possible this conversion from obsolete incandescent lights resulting in twice the street illumination at approximately the same cost to the City. The change-over involves not only the replacement of fixtures but also, on some streets, new poles to achieve better light distribution.

A total of 199 new street lights, valued at \$157,700, was added to the City-owned underground system. A summary of these additions is shown in Table 14, and the historical cost of City-owned street lighting construction is shown in Table 15.

At year's end, bids were received by the Department of Public Works for the first three contracts under the \$7 million, 1964 Street Lighting Bond Issue. These contracts will provide lights on Brotherhood Way which presently has none, replace a badly deteriorated system on Clipper Street, Portola to Douglass, and replace an inadequate system in St. Mary's Park.

Complaints And Damages

During the year, 215 complaints requiring field investigation were received and acted upon. These complaints concerned inadequate illumination, objectionable glare in windows, and property owners requesting relocation of street lighting poles. In addition, there were approximately 800 complaints relating to the modernization program which did not require field investigation because they were resolved at the time of the complaint.

In 1964-65, there were 103 accidents involving damage to City-owned street lighting property. Investigation was made as soon as possible to remove hazards to the public and obstructions to traffic. Every effort was made to secure reimbursement for damages incurred from responsible parties. Total cost of repairs to damaged City-owned street lighting property was \$46,263.

A summary of number of accidents, cost of repairs, and collections is shown in Table 13.

VI. UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated by Hetch Hetchy power system and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas and steam supplied to municipal departments was furnished by Pacific Gas and Electric Company under a service contract.

Municipal Consumption Of Electricity, Gas And Steam

During the fiscal year 1964-65, a total of 315,641,700 kilowatt-hours of electricity was supplied through 831 accounts for municipal uses, including street lighting and traffic devices. City departments paid to the Hetch Hetchy Project a total of \$3,302,500 for electricity. At the same time, 15,566,000 hundred cubic feet of natural gas was consumed through 504 accounts, and 1,874,000 pounds of steam was utilized by one account, for which Pacific Gas and Electric Company was paid \$848,300 and \$3,800 respectively.

A summary of consumption and expenditures for these commodities is shown in Tables 9 and 10.

San Francisco International Airport

The Department rendered service to San Francisco International Airport in the operation of City-owned electric distribution system within the Airport boundary. This service included supervising installation and testing of the associated metering facilities, performing necessary monthly meter readings, and preparing statements for billing Airport tenants. During the fiscal year, 74 tenants were supplied a total of 65,221,300 kilowatt-hours of electricity through 203 metered and 53 unmetered accounts, for which the Airport Department collected \$837,500. Also, one tenant was supplied 16,166,000 pounds of steam through three meters, for which the Airport Department received \$15,134.

TABLE 1
HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)
FISCAL YEAR 1964-65

| <u>OE</u> | <u>DESCRIPTION</u> | <u>BUDGET</u> | <u>ACTUAL</u> | <u>-UNDER, OVER</u> |
|---------------------------------|------------------------------------|---------------------|---------------------|---------------------|
| 110 | Permanent Salaries | \$ 325,587 | \$ 296,785 | \$-28,802 |
| 111 | Allowance for Overtime | 2,400 | 2,891 | 491 |
| 112 | Allowance for Holidays | 2,800 | 1,185 | -1,615 |
| 113 | Extended Work Week | 20,404 | 16,455 | -3,949 |
| 120 | Temporary Salaries | 16,000 | 15,879 | -121 |
| 130 | Wages | 731,551 | 717,624 | -13,927 |
| 139 | Salaries - Gardeners | 26,256 | 26,256 | -0- |
| 200 | Contractual Service | 35,183 | 32,719 | -2,464 |
| 216 | Maint. & Repair of Auto Equipment | 32,000 | 31,619 | -381 |
| 231-1 | Purchase of Power for Resale | 2,285,700 | 2,144,702 | -140,998 |
| 231-2 | Service Charge for Transm. & Dist. | 2,287,100 | 2,291,383 | 4,283 |
| 251 | Subsistence of Employees | 8,500 | 10,800 | 2,300 |
| 269 | Antitrust Actions | -0- | 121,000 | 121,000 |
| 295 | Legislative Expense | 1,000 | 608 | -392 |
| 300 | Material and Supplies | 65,800 | 64,950 | -850 |
| 350 | Foodstuffs | 13,327 | 13,823 | 496 |
| 640 | Water Rights and Damage Claims | 22,750 | 20,218 | -2,532 |
| 641 | Hydrography | 29,310 | 28,615 | -695 |
| 801 | Accident Compensation | 4,510 | 11,750 | 7,240 |
| 812 | Fidelity Insurance | 53 | 36 | -17 |
| 813 | Automobile Insurance | 4,060 | 2,959 | -1,101 |
| 814 | Fire Insurance | 11,500 | 6,206 | -5,294 |
| 815 | Miscellaneous Insurance | 10,000 | 7,699 | -2,301 |
| 854 | Membership Dues | 271 | 246 | -25 |
| 855 | Fee to U.S. Gov't. - Raker Act | 30,000 | 30,000 | -0- |
| 856 | Maint. Roads & Trails - Raker Act | 25,000 | 6,828 | -18,172 |
| 860 | Retirement Allowance | 60,775 | 60,246 | -529 |
| 862 | Social Security | 16,008 | 17,443 | 1,435 |
| 865 | Health Service System | 16,795 | 16,599 | -196 |
| 870 | Taxes | 232,600 | 228,545 | -4,055 |
| 880 | Rentals - Transmission Lines | 54,000 | 54,000 | -0- |
| 900 | Services of Other Depts. | 440,053 | 430,766 | -9,287 |
| TOTAL OPERATION AND MAINTENANCE | | \$6,811,293 | \$6,710,835 | \$-100,458 |
| 400 | Equipment | 51,140 | 41,614 | -9,526 |
| 500 | Additions and Betterments | -0- | -0- | -0- |
| 700 | Reconstruction and Replacement | 17,000 | 17,000* | -0- |
| | Replacement of Moccasin Powerhouse | 4,125,000 | 4,125,000** | -0- |
| 800 | Bond Interest and Redemption | 7,702,397 | 7,519,835 | -182,562 |
| TOTAL | | <u>\$18,706,830</u> | <u>\$18,414,284</u> | <u>\$-292,546</u> |

* Unexpended balance transferred to unallocated balance of appropriation.

** Includes expenditures, encumbrances, and unencumbered balance allocated for subsequent construction.

TABLE 2
HETCH HETCHY WATER SUPPLY AND POWER SYSTEM

SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1964-65

| | <u>BUDGET</u> | <u>ACTUAL</u> | <u>-UNDER
OVER</u> |
|---|---------------------|---------------------|------------------------|
| <u>RECEIPTS</u> | | | |
| Revenue from Sale of Electric Energy | \$11,569,800 | \$10,789,731 | \$-780,069 |
| Revenue from Sale of Water and
Standby Charge, SFW | 4,500,000 | 4,500,000 | -0- |
| Other Revenue | 65,000 | 72,512 | 7,512 |
| | <hr/> | <hr/> | <hr/> |
| Total Gross Revenue | \$16,134,800 | \$15,362,243 | \$-772,557 |
| Surplus from Prior Years | 2,572,030 | 3,052,041 | 480,011 |
| | <hr/> | <hr/> | <hr/> |
| Total Receipts | <u>\$18,706,830</u> | <u>\$18,414,284</u> | <u>\$-292,546</u> |
|
<u>EXPENDITURES</u> | | | |
| Total Expenditures (from Table 1) | <u>\$18,706,830</u> | <u>\$18,414,284</u> | <u>\$-292,546</u> |

TABLE 3
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

| | <u>Normal</u> | <u>1960-61</u> | <u>1961-62</u> | <u>1962-63</u> | <u>1963-64</u> | <u>1964-65</u> |
|--|------------------|----------------|------------------|------------------|----------------|----------------------|
| <u>SEASON PRECIPITATION (INCHES)</u> | | | | | | |
| Hetch Hetchy | 33.72 | 23.38 | 33.57 | 40.08 | 25.28 | 41.33 |
| Lake Lloyd | --- | 24.47 | 48.48 | 52.33 | 34.95 | 60.16 |
| Approx. Percent of Normal | | 69% | 99% | 118% | 75% | 122% |
| <u>WATERSHED RUNOFF (ACRE-FT.)(a)(b)</u> | | | | | | |
| Hetch Hetchy | 716,200 | 375,434 | 783,989 | 837,352 | 481,733 | 914,105 (c) |
| Lake Lloyd | 416,400 | 203,059 | 451,631 | 436,377 | 278,085 | 586,718 (c) |
| Lake Eleanor | | | | | | |
| Total | <u>1,132,600</u> | <u>578,493</u> | <u>1,235,620</u> | <u>1,273,729</u> | <u>759,818</u> | <u>1,500,823 (c)</u> |
| Approx. Percent of Normal | | 51% | 108% | 111% | 66% | 133% |
| <u>RESERVOIR STORAGE (ACRE-FT.)(b)</u> | | | | | | |
| No-Spill Capacity | | | | | | |
| Hetch Hetchy | 360,360 | 195,572 | 355,244 | 353,480 | 337,935 | 318,089 |
| Lake Lloyd | 268,200 | 69,973 | 248,577 | 266,112 | 117,406 | 233,368 |
| Lake Eleanor | 27,100 | 11,331 | 26,436 | 25,681 | 8,946 | 26,339 |
| Total | <u>655,660</u> | <u>276,876</u> | <u>630,257</u> | <u>645,273</u> | <u>464,287</u> | <u>577,796</u> |
| <u>DELIVERY TO SFWD (ACRE-FT.)(b)(d)</u> | | | | | | |
| Average per day | | 445 | 482 | 386 | 405 | 461 |
| Maximum per day | | 500 | 502 | 494 | 533 | 530 |
| Total for fiscal year | | 162,547 | 175,903 | 140,769 | 148,287 | 168,405 |
| Total since operation of Hetch Hetchy Aqueduct began in 1934 | | | | | 2,485,820 | |

- NOTES: (a) For Water Year, November 1 to October 31.
 (b) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.
 (c) Estimated.
 (d) Includes delivery to Livermore site, U. S. Atomic Energy Commission.

TABLE 4
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1964-65

| <u>PLANT DATA</u> | <u>Rated Capacity</u>
<u>(Kilowatts)</u> | <u>Peak Generation</u>
<u>(Kilowatts)</u> | <u>Annual Plant</u>
<u>Factor - %</u> |
|-----------------------------------|---|--|--|
| Moccasin Powerhouse | 70,000 | 82,000 | 84.4 |
| Cherry Powerhouse | 135,000 | 148,000 | 64.2 |
| Early Intake Powerhouse (Standby) | <u>3,600</u> | --- | --- |
| Total | 208,600 | | |

ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)

Gross Generation

| | | |
|-----------------------------------|--------------|---------------|
| Moccasin Powerhouse | 517,321,000 | |
| Cherry Powerhouse | 759,505,000 | |
| Early Intake Powerhouse (Standby) | <u>9,000</u> | 1,276,835,000 |

Station Service

| | | |
|-----------------------------------|------------|------------------|
| Moccasin Powerhouse | 813,000 | |
| Cherry Powerhouse | 1,291,120 | |
| Early Intake Powerhouse (Standby) | <u>400</u> | <u>2,104,520</u> |

Net Generation

1,274,730,480

Supplementary Energy

| | | |
|-----------------------------|--------------------|--------------------|
| P.G. & E. Co. (Replacement) | 2,972,600 | |
| P.G. & E. Co. (Purchase) | <u>335,040,505</u> | <u>338,013,105</u> |

Total

1,612,743,585

ENERGY DISTRIBUTED (KILOWATT-HOURS)

Sales

| | |
|--|-------------|
| Municipal Accounts | 315,641,672 |
| Modesto Irrigation District | 415,564,800 |
| Turlock Irrigation District | 141,799,500 |
| *Kaiser Cement & Gypsum Corporation | 151,942,208 |
| Kaiser Aluminum and Chemical Corporation | 15,998,280 |
| Dow Chemical Company | 313,575,384 |
| Hercules Powder Company | 134,568,000 |
| Miscellaneous Customers | 3,674,179 |

Non-Revenue

| | |
|--|------------|
| Project Use | 3,309,842 |
| Pacific Gas and Electric Company (Replacement) | 21,113,148 |

Losses

| | |
|--|-------------------|
| Hetch Hetchy System | 29,878,719 |
| P.G. & E. System (Municipal and Industrial Accounts) | <u>65,677,853</u> |

Total

1,612,743,585

*Formerly Permanente Cement Company

TABLE 5
HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1963-64 AND 1964-65
(Nearest 100,000 Kilowatt-Hours)

| <u>CUSTOMER</u> | <u>1963-64</u> | <u>1964-65</u> |
|------------------------------------|----------------------|----------------------|
| Municipal Accounts | | |
| International Airport | 76,600,000 | 89,500,000 |
| Municipal Railway | 68,000,000 | 67,900,000 |
| Public Works | 18,700,000 | 19,300,000 |
| Street Lighting | 36,600,000 | 37,600,000 |
| Unified School District | 20,000,000 | 21,200,000 |
| Water Department | 33,300,000 | 35,600,000 |
| Other City Departments | 39,900,000 | 44,500,000 |
| Modesto Irrigation District | 386,300,000 | 415,600,000 |
| Turlock Irrigation District | 151,800,000 | 141,800,000 |
| *Kaiser Cement & Gypsum Corp. | 155,400,000 | 151,900,000 |
| Kaiser Aluminum and Chemical Corp. | 14,500,000 | 16,000,000 |
| Dow Chemical Company | 303,900,000 | 313,600,000 |
| Hercules Powder Company | 133,800,000 | 134,600,000 |
| Shell Chemical Company | 66,600,000 | -- |
| All Other Sales | 12,400,000 | 3,700,000 |
| | <u>1,517,800,000</u> | <u>1,492,800,000</u> |
| TOTAL | | |

TABLE 6
HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1963-64 AND 1964-65
(Nearest \$1,000)

| <u>CUSTOMER</u> | <u>1963-64</u> | <u>1964-65</u> |
|------------------------------------|---------------------|---------------------|
| Municipal Accounts | | |
| International Airport | \$ 644,000 | \$ 743,000 |
| Municipal Railway | 688,000 | 683,000 |
| Public Works | 226,000 | 239,000 |
| Street Lighting | 388,000 | 400,000 |
| Unified School District | 333,000 | 350,000 |
| Water Department | 289,000 | 311,000 |
| Other City Departments | 525,000 | 577,000 |
| Modesto Irrigation District | 1,978,000 | 2,249,000 |
| Turlock Irrigation District | 776,000 | 795,000 |
| *Kaiser Cement & Gypsum Corp. | 1,281,000 | 1,195,000 |
| Kaiser Aluminum and Chemical Corp. | 99,000 | 152,000 |
| Dow Chemical Company | 2,063,000 | 2,130,000 |
| Hercules Powder Company | 916,000 | 917,000 |
| Shell Chemical Company | 451,000 | -- |
| All Other Sales | 137,000 | 49,000 |
| | <u>\$10,794,000</u> | <u>\$10,790,000</u> |
| TOTAL | | |

*Formerly Permanente Cement Company

TABLE 7

HETCH HETCHY POWER SYSTEM
ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

| NET GENERATION | 1959-60 | 1960-61 | 1961-62 | 1962-63 | 1963-64 | 1964-65 |
|-------------------------------------|-------------|---------------|---------------|---------------|---------------|---------------|
| Moccasin Powerhouse | 519,258,400 | 469,300,100 | 390,534,500 | 527,332,900 | 527,570,400 | 516,508,000 |
| Cherry Powerhouse | --- | 451,179,360 | 398,956,200 | 759,063,980 | 972,596,880 | 758,213,880 |
| Early Intake Powerhouse | 17,951,026 | 1,749,306 | 0 | 28,990 | 4,395 | 8,600 |
| Subtotal | 537,209,426 | 922,228,766 | 789,490,700 | 1,286,425,870 | 1,500,171,675 | 1,274,730,480 |
| SUPPLEMENTARY ENERGY | | | | | | |
| P.G.& E. Co. (Replacement) | --- | --- | --- | 17,614,531 | 4,252,209 | 2,972,600 |
| P.G.& E. Co. (Purchase) | 384,528,298 | 116,235,950 | 401,108,639 | 10,765,908 | 114,717,222 | 335,040,505 |
| Subtotal | 384,528,298 | 116,235,950 | 401,108,639 | 28,380,439 | 118,969,431 | 338,013,105 |
| TOTAL | 921,737,724 | 1,038,464,716 | 1,190,599,339 | 1,314,806,309 | 1,619,141,106 | 1,612,743,585 |
| DISTRIBUTION | | | | | | |
| Sales | | | | | | |
| Municipal Accounts | 252,584,748 | 257,641,932 | 268,283,987 | 271,930,805 | 293,160,152 | 315,641,672 |
| Modesto Irrig. Dist. | 300,501,600 | 348,864,000 | 353,976,000 | 343,344,000 | 386,283,000 | 415,564,800 |
| Turlock Irrig. Dist. | 130,742,402 | 169,960,571 | 170,649,231 | 118,488,000 | 151,771,700 | 141,799,500 |
| *Kaiser Cement & Cypsum | 152,045,469 | 140,764,680 | 141,273,870 | 138,773,712 | 155,387,840 | 151,942,208 |
| Kaiser Aluminum Corp. | 13,272,000 | 13,152,000 | 13,776,000 | 14,424,000 | 14,496,000 | 15,998,280 |
| Dow Chemical Co. | --- | 44,011,368 | 156,102,552 | 301,810,584 | 303,892,152 | 313,575,384 |
| Hercules Powder Co. | --- | --- | --- | 23,544,000 | 133,758,000 | 134,568,000 |
| Shell Chemical Co. | --- | 668,872 | --- | --- | 66,618,000 | --- |
| Misc. Customers | 4,197,071 | --- | 650,398 | 9,010,930 | 12,406,416 | 3,674,179 |
| P.G.& E. Co. (Dump) | --- | 1,060,607 | --- | --- | --- | --- |
| Non-Revenue | | | | | | |
| Project Use | 3,246,239 | 3,168,162 | 3,535,696 | 3,314,272 | 3,627,929 | 3,309,842 |
| P.G.& E. Co. (Replacement) | --- | --- | 13,426,572 | 8,440,168 | 0 | 21,113,148 |
| Losses | 65,148,195 | 64,172,524 | 68,925,033 | 81,725,838 | 97,739,917 | 95,556,572 |
| TOTAL | 921,737,724 | 1,038,464,716 | 1,190,599,339 | 1,314,806,309 | 1,619,141,106 | 1,612,743,585 |
| *Formerly Permanente Cement Company | | | | | | |

TABLE 8
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1964-65

| <u>OE</u> | <u>DESCRIPTION</u> | <u>BUDGET</u> | <u>ACTUAL</u> | <u>-UNDER
OVER</u> |
|---------------------|--|--------------------|--------------------|------------------------|
| <u>EXPENDITURES</u> | | | | |
| 110 | Permanent Salaries | \$ 101,027 | \$ 99,421 | \$-1,606 |
| 111 | Allowance for Overtime | 300 | 469 | 169 |
| 112 | Allowance for Holidays | -0- | 67 | 67 |
| 200 | Contractual Services | 2,985 | 2,377 | -608 |
| 231 | Lighting and Heating of
Public Buildings - General | 846,597 | 896,056 | 49,459 |
| 231-1 | Lighting and Heating of
Public Bldgs. - Special Funds | 2,730,285 | 2,871,927 | 141,642 |
| 231-2 | Lighting of Public Streets -
Pacific Gas and Electric Co. | 508,646 | 564,822 | 56,176 |
| 231-3 | Lighting of Public Streets -
Hetch Hetchy | 370,765 | 387,782 | 17,017 |
| 300 | Materials and Supplies | 725 | 689 | -36 |
| 400 | Equipment | -0- | -0- | -0- |
| 801 | Accident Compensation | 91 | -0- | -91 |
| 813 | Auto Insurance | 300 | 215 | -85 |
| 860 | Retirement Allowance | 5,336 | 5,729 | 393 |
| 862 | Social Security | 1,740 | 1,611 | -129 |
| 865 | Health Service System | 2,375 | 2,632 | 257 |
| | TOTAL | <u>\$4,571,172</u> | <u>\$4,833,797</u> | <u>\$262,625</u> |

RECEIPTS

| | | | |
|----------------------|--------------------|--------------------|------------------|
| Interfund Receipts * | \$2,774,585 | \$2,914,938 | \$140,353 |
| Ad Valorem Taxes | 1,796,587 | 1,918,859 | 122,272 |
| TOTAL | <u>\$4,571,172</u> | <u>\$4,833,797</u> | <u>\$262,625</u> |

WORK ORDER APPROPRIATIONS FROM ROAD FUND

| <u>DESCRIPTION</u> | <u>TOTAL
FUNDS</u> | <u>EXPENDITURE</u> | <u>-UNDER
OVER</u> |
|--|------------------------|--------------------|------------------------|
| Alteration and Repair of
Street Lighting Structures | \$ 4,000 | \$ 3,997 | \$ -3 |
| Maintenance and Repair of
Street Lighting Installations | 92,700 | 90,860 | -1,840 |
| TOTAL | <u>\$96,700</u> | <u>\$94,857</u> | <u>\$-1,843</u> |

* Transfers from other departments.

TABLE 9
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1964-65

| <u>DEPARTMENT</u> | <u>NO. OF
ACCOUNTS</u> | <u>CONSUMPTION
KILOWATT-HOURS</u> | <u>EXPENDITURE</u> |
|--------------------------------------|----------------------------|---------------------------------------|---------------------|
| Art Museum | 1 | 546,834 | \$ 6,553 |
| Auditorium and Brooks Hall | 3 | 3,995,900 | 46,226 |
| Child Care Centers | 8 | 71,442 | 1,841 |
| City Planning | 1 | 67,920 | 1,417 |
| DeYoung Museum | 3 | 431,080 | 6,837 |
| Disaster Corps | 2 | 2,438 | 100 |
| Electricity | 4 | 381,620 | 6,880 |
| Farmers Market | 1 | 7,768 | 205 |
| Fire (a) | 58 | 1,917,862 | 42,604 |
| Hassler Health Home | 1 | 709,080 | 7,892 |
| Health | 21 | 6,908,920 | 70,620 |
| Hetch Hetchy | 6 | 94,030 | 2,747 |
| International Airport (Incl.resale) | 8 | 89,508,802 | 742,815 |
| Legion of Honor | 5 | 311,304 | 5,871 |
| Library | 31 | 2,244,505 | 38,096 |
| Log Cabin Ranch | 10 | 259,818 | 7,293 |
| Municipal Railway | 39 | 67,848,000 | 682,470 |
| Parking Authority | 1 | 4,209 | 116 |
| Police | 18 | 568,779 | 12,268 |
| Public Buildings | 9 | 11,990,581 | 114,004 |
| Public Welfare | 2 | 318,760 | 4,575 |
| Public Works | 50 | 19,329,477 | 234,488 |
| Purchasing | 6 | 373,352 | 5,966 |
| Real Estate | 2 | 48 | 3 |
| Record Center | 1 | 205 | 11 |
| Recreation and Park | 184 | 8,100,272 | 133,569 |
| Sheriff | 2 | 1,232,160 | 12,340 |
| Street Lighting Operations | - | 37,641,792 | 387,782 |
| Unified School District | 244 | 21,233,334 | 350,246 |
| War Memorial | 1 | 859,166 | 12,058 |
| Water | 102 | 35,553,668 | 310,851 |
| Youth Guidance | 1 | 1,235,760 | 13,233 |
| TOTAL MUNICIPAL DEPARTMENTS | 825 | 313,748,886 | \$ 3,261,977 |
| Academy of Sciences | 4 | 1,892,786 | 20,975 |
| Flower Show | - | (b) | 1,617 |
| Mount Davidson Cross Lighting | - | (b) | 1,300 |
| State of Calif.: Street Lighting | 1 | (c) | 11,736 |
| Traffic Devices | 1 | (d) | 4,939 |
| TOTAL FROM HETCH HETCHY | 831 | 315,641,672 | \$ 3,302,544 |
| Fire Dept., For Resale to Fort Mason | 1 | 2,866,554 | 36,760 |
| GRAND TOTAL | 832 | 318,508,226 | \$ 3,339,304 |

NOTES: (a) Electricity purchased for resale to Fort Mason excluded.
 (b) Included under Recreation and Park.
 (c) Included under Street Lighting Operations.
 (d) Included under Public Works.

TABLE 10
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1964-65

NATURAL GAS

| <u>DEPARTMENT</u> | <u>NO. OF
ACCOUNTS</u> | <u>CONSUMPTION
HUNDRED CU. FT.</u> | <u>EXPENDITURE *</u> |
|------------------------------------|----------------------------|--|----------------------|
| Auditorium and Brooks Hall | 2 | 363 | \$ 49 |
| Child Care Centers | 8 | 26,518 | 1,769 |
| City Planning | 1 | 5,980 | 387 |
| DeYoung Museum | 2 | 66,864 | 3,760 |
| Disaster Corps | 1 | 374 | 37 |
| Electricity | 2 | 44,638 | 2,789 |
| Farmers Market | 1 | 446 | 41 |
| Fire | 59 | 638,257 | 39,122 |
| Hassler Health Home | 3 | 284,390 | 17,584 |
| Health | 18 | 3,866,316 | 179,028 |
| Hetch Hetchy | 2 | 2,066 | 171 |
| International Airport | 14 | 1,769,851 | 88,933 |
| Library | 28 | 95,413 | 6,305 |
| Municipal Railway | 12 | 240,899 | 14,990 |
| Police | 10 | 53,720 | 3,490 |
| Public Buildings | 4 | 1,313,974 | 65,871 |
| Public Works | 10 | 328,788 | 22,566 |
| Purchasing | 3 | 56,258 | 3,409 |
| Real Estate | - | -- | -- |
| Recreation and Park | 99 | 1,216,947 | 75,202 |
| Registrar of Voters | 1 | 7,265 | 459 |
| Sheriff | 2 | 403,039 | 20,850 |
| Single Men's Rehabilitation Center | 1 | 36,278 | 2,269 |
| Unified School District | 202 | 4,138,227 | 246,069 |
| War Memorial | 3 | 204,550 | 12,430 |
| Water | 12 | 110,115 | 7,142 |
| Youth Guidance | 2 | 432,526 | 21,866 |
| TOTAL MUNICIPAL DEPARTMENTS | 502 | 15,344,062 | \$836,588 |
| Academy of Sciences | 2 | 221,948 | 11,703 |
| GRAND TOTAL | 504 | 15,566,010 | \$848,291 |

STEAM

(Does not include steam generated by City)

| <u>DEPARTMENT</u> | <u>NO. OF
ACCOUNTS</u> | <u>CONSUMPTION
POUNDS</u> | <u>EXPENDITURE</u> |
|-------------------|----------------------------|-------------------------------|--------------------|
| Public Welfare | 1 | 1,874,100 | \$ 3,764 |

* Includes refund credit involving El Paso Natural Gas Company.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1965

| <u>SIZE & TYPE OF LAMP</u> | <u>COMPANY-
OWNED</u> | <u>JOINTLY-
OWNED</u> | <u>CITY-
OWNED</u> | <u>TOTAL</u> |
|-------------------------------------|---------------------------|---------------------------|------------------------|---------------|
| <u>UNDERGROUND CONNECTED</u> | | | | |
| <u>High Voltage Series Circuit</u> | | | | |
| 1,000-Lumen Incandescent | -- | 22 | -- | 22 |
| 2,500 " " | 325 | 199 | 476 | 1,000 |
| 4,000 " " | 2,263 | 553 | 2,814 | 5,630 |
| 6,000 " " | 756 | 619 | 4,707 | 6,082 |
| 10,000 " " | 400 | -- | 570 | 970 |
| 23,000 " Fluorescent | 3 | -- | 16 | 19 |
| 175-Watt Mercury Vapor | 1 | -- | 24 | 25 |
| 400 " " | 13 | 44 | 91 | 148 |
| 1,000 " " | -- | -- | 3 | 3 |
| <u>Low Voltage Multiple Circuit</u> | | | | |
| 1,000-Lumen Incandescent | -- | -- | 173 | 173 |
| 2,500 " " | 11 | 4 | 33 | 48 |
| 4,000 " " | 191 | 3 | 70 | 264 |
| 6,000 " " | 81 | 9 | 76 | 166 |
| 10,000 " " | 2 | -- | 16 | 18 |
| 23,000 " Fluorescent | 38 | -- | 100 | 138 |
| 100-Watt Mercury Vapor | -- | -- | 9 | 9 |
| 175 " " | 6 | -- | 218 | 224 |
| 250 " " | 27 | -- | 87 | 114 |
| 400 " " | 887 | -- | 656 | 1,543 |
| 700 " " | -- | -- | 7 | 7 |
| 1,000 " " | -- | -- | 6 | 6 |
| <u>OVERHEAD CONNECTED</u> | | | | |
| <u>High Voltage Series Circuit</u> | | | | |
| 2,500-Lumen Incandescent | 107 | -- | -- | 107 |
| 4,000 " " | 4,929 | -- | 52 | 4,981 |
| 6,000 " " | 148 | -- | 2 | 150 |
| <u>Low Voltage Multiple Circuit</u> | | | | |
| 2,500-Lumen Incandescent | 29 | -- | -- | 29 |
| 4,000 " " | 194 | -- | 6 | 200 |
| 6,000 " " | 8 | -- | -- | 8 |
| 175-Watt Mercury Vapor | 9,363 | -- | 1 | 9,364 |
| 250 " " | 1,293 | -- | 2 | 1,295 |
| 400 " " | 496 | -- | -- | 496 |
| TOTAL, JUNE 30, 1965 | <u>21,571</u> | <u>1,453</u> | <u>10,215</u> | <u>33,239</u> |
| | 64.90% | 4.37% | 30.73% | 100% |
| TOTAL, JUNE 30, 1964 | <u>19,088</u> | <u>1,447</u> | <u>10,021</u> | <u>30,556</u> |
| NET CHANGE DURING THE YEAR | +2,483 | +6 | +194 | +2,683 |

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1964-65

CONTRACTUAL SERVICE

P. G. & E. Company

| | | | |
|--|--------------|----------------|------------|
| Company-owned facilities (a) | \$794,895 | | |
| Jointly-owned facilities (a) | 62,933 | | |
| City-owned facilities (b) | 213,275 | | |
| Emergency service to City-owned facilities | <u>2,929</u> | \$1,074,032 | |
| Less deduction for energy component | | <u>485,786</u> | \$ 588,246 |

Lease-Lite Corporation

| | | | |
|--|--|--|--------|
| Group lamp replacement - City-owned facilities | | | 29,426 |
|--|--|--|--------|

Emsco Electric Corporation

| | | | |
|---|--|---------------|--------|
| Maintenance and repair - City-owned facilities: | | | |
| Routine maintenance | | 7,125 | |
| Repair of damage caused by accidents (c) | | 29,036 | |
| Repair of damage caused by equipment failure | | <u>12,229</u> | 48,390 |

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

| | | | |
|------------------------------------|--------------|--|-------|
| Damage caused by accidents (c) | 6,554 | | |
| Damage caused by equipment failure | <u>3,170</u> | | 9,724 |

ELECTRIC ENERGY (HETCH HETCHY)

| | | | |
|--|--|----------------|--|
| 37,641,792 kwh @ \$0.01345 less 21% discount | | <u>399,962</u> | |
|--|--|----------------|--|

TOTAL EXPENDITURE \$1,075,748

LESS AMOUNT PAID TO HETCH HETCHY FROM:

| | | | |
|---|------------|--|---------------|
| Gas Tax Funds for State Highway routes | 11,736 | | |
| Recreation and Park Dept. for off-street lighting | <u>445</u> | | <u>12,181</u> |

TOTAL NET EXPENDITURE \$1,063,567

AVERAGE OPERATING COST

| | |
|---|----------------|
| Based on number of lights in service June 30, 1965, average total cost of operation, maintenance and repair per light per year: | <u>\$32.36</u> |
|---|----------------|

- NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.
- (b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.
- (c) When responsible party is known, claim is filed for recovery of costs. (See Table 13)

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER
ACCIDENT DAMAGE TO CITY-OWNED STREET LIGHTING
BY FISCAL YEARS

| | <u>1961-62</u> | <u>1962-63</u> | <u>1963-64</u> | <u>1964-65</u> |
|---|----------------|----------------|----------------|----------------|
| Number of Accidents | 89 | 85 | 91 | 103 |
| Cost of Damage Repairs (a) | \$ 25,740 | \$ 35,323 | \$ 39,748 | \$ 46,263 (b) |
| Average Cost Per Accident | 289 | 416 | 437 | 449 (b) |
| Amount Billed Responsible Parties (c) | 32,361 | 27,818 | 23,759 | 50,441 |
| Amount Collected: | | | | |
| By Bureau of Light, Heat and Power | 14,010 | 11,070 | 15,995 | 14,825 |
| By Bureau of Delinquent Revenue (d) (e) | 6,855 | 8,658 | 7,803 | 3,741 |
| Amount Abandoned (Uncollectible) | 8,724 | 4,269 | 9,096 | 9,935 |
| Amount Receivable June 30: | | | | |
| Payable to Bureau of Light, Heat and Power | 3,553 | 3,982 | 3,810 | 12,923 |
| Payable to Bureau of Delinquent Revenue (e) | 22,240 | 25,605 | 13,749 | 35,564 |

NOTES: (a) Includes administrative expense.
 (b) Includes estimated cost of uncompleted work as of June 30, 1965.
 (c) Includes only cases of current and previous year for which work was completed during the year.
 (d) Includes installment payments on cases from previous years.
 (e) Accounts are transferred to Bureau of Delinquent Revenue when:
 1. Account is over 90 days old;
 2. Installment payments are made;
 3. Liability is denied;
 4. Responsible party is deceased or his whereabouts unknown.

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1964-65

| <u>Location</u> | <u>No. of
Lights</u> | <u>Type of
Light(a)</u> | <u>Source of
Funds (b)</u> | <u>Value</u> |
|---|--------------------------|-----------------------------|--------------------------------|------------------|
| Cuvier Overpass - Southern Freeway | 7 | F | DPW | \$ 6,800 |
| Washington St. - Maple to Locust | 13 | M | DPW | 15,885 |
| Lake Merced Blvd. at John Muir Drive | 15 | M | DPW | 11,230 |
| Telephone Building
Third and Folsom Sts. | 12 | M | PO | 8,975 |
| Geary St. at Leavenworth
Turk St. at Stanyan | 6 | M | DPW | 4,500 |
| Francisco Heights | 17 | M | DPW | 14,874 |
| Great Highway Extension | 18 | M | DPW | 13,000 |
| Fourth Street Bridge | 2 | M | DPW | 2,000 |
| Tompkins Ave. Stairs | 2 | M | DPW | 1,900 |
| Parnassus Street - U. C. Hospital | 1 | M | DPW | 824 |
| Golden Gateway | 20 | M | DPW | 13,500 |
| Southern Freeway | 52
14
2 | M
I
F | STATE | 50,857 |
| Telegraph Hill - (Stages II and III) | 18 | M | DPW | 13,333 |
| | <hr/> | | | <hr/> |
| TOTAL | <u>199</u> | | | <u>\$157,678</u> |

NOTES: (a) F - Fluorescent
I - Incandescent
M - Mercury Vapor

(b) DPW - Department of Public Works
PO - Property Owner

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER
HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

| Fiscal Year | City Funds | | Housing Auth. | Federal Funds | State Funds | Property Owners | Total |
|---|-------------|------------------------|---------------|---------------|-------------|-----------------|-------------|
| | P. U. C. | D. P. W. Park Mun. Ry. | | | | | |
| Prior to | | | | | | | |
| July 1, 1940 | \$ 366,959 | \$ 418,361 | \$ - | \$336,070 | \$ - | \$123,856 | \$1,245,246 |
| 1940-41 | 5,380 | 10,910 | - | 45,376 | - | 40,827 | 102,493 |
| 1941-42 | 1,980 | 2,445 | - | 13,720 | - | 32,800 | 50,945 |
| 1942-43 | 3,969 | 8,345 | - | - | - | 3,718 | 16,032 |
| 1943-44 | 470 | 4,902 | - | - | - | 371 | 5,743 |
| 1944-45 | 450 | - | - | - | - | 5,738 | 6,188 |
| 1945-46 | 298 | - | 1,166 | - | - | 350 | 1,814 |
| 1946-47 | 4,357 | - | - | - | - | - | 4,357 |
| 1947-48 | 112,615 | 76,768 | 14,295 | - | - | 112,847 | 317,635 |
| 1948-49 | 257,052 | 9,043 | - | - | - | 22,987 | 289,682 |
| 1949-50 | 303,629 | 27,194 | 6,350 | - | - | 12,394 | 349,567 |
| 1950-51 | 155,842 | 101,576 | - | - | - | 165,043 | 422,461 |
| 1951-52 | 27,154 | 47,698 | - | - | 22,650 | 23,695 | 127,003 |
| 1952-53 | 251,090 | 219,956 | 5,806 | - | - | 31,778 | 503,329 |
| 1953-54 | 142,151 | 22,181 | 505 | - | - | 23,495 | 191,340 |
| 1954-55 | 115,727 | 30,817 | - | - | 2,274 | 23,495 | 164,413 |
| 1955-56 | 15,704 | 48,620 | 543 | - | 16,578 | 748 | 87,349 |
| 1956-57 | 114,168 | 26,641 | 1,360 | - | 19,181 | 2,484 | 151,068 |
| 1957-58 | 2,501 | 64,942 | 3,003 | - | - | 7,256 | 89,784 |
| 1958-59 | - | 171,367 | - | - | 4,142 | 18,199 | 182,762 |
| 1959-60 | - | 100,126 | - | - | 626 | 10,231 | 150,325 |
| 1960-61 | - | 82,074 | - | - | 10,242 | 35,874 | 103,175 |
| 1961-62 | - | 200,113 | 7,993 | - | - | 19,236 | 349,032 |
| 1962-63 | - | 84,328 | - | - | - | 21,700 | 106,028 |
| 1963-64 | - | 340,108 | - | - | - | 32,556 | 378,664 |
| 1964-65 | - | 97,846 | - | - | 50,857 | 8,975 | 157,678 |
| TOTAL | \$1,882,096 | \$2,196,361 | \$25,672 | \$395,166 | \$157,100 | \$873,534 | \$5,554,113 |
| LESS: | | | | | | | |
| Cost of portions removed prior to fiscal year 1964-65 | | | | | | 190,796 | 195,430 |
| Cost of portions removed during fiscal year 1964-65 | | | | | | 4,634 | \$5,358,683 |
| Original Cost of City-owned facilities in service June 30, 1965 | | | | | | | |

TABLE 16
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1964-65

| Contract No. | Description | Contractor | Contract Time Started | Contract Time Completed | Original Contract Price | Value of Work Done During Fiscal Year |
|--------------|--|---|-----------------------|-------------------------|-------------------------|---------------------------------------|
| HH-331 | Synchronous Generators Canyon Powerhouse | Ets-Hokin Corp. | 12-2-63 | --- | \$ 831,725 | \$ 5,825 |
| HH-349 | Canyon Power Tunnel | The Clancy M. O'Dell Construction Company | 1-8-62 | 2-26-65 | 11,169,895 | 584,900 |
| HH-354 | Debris Reflector Moccasin Creek | George Reed, Inc. | 12-14-64 | 5-12-65 | 63,040 | 64,092 |
| HH-357 | San Joaquin Pipeline No. 3 Section B | Kaiser Steel Corp. | 7-1-63 | 2-19-65 | 6,603,992 | 1,249,732 |
| HH-363 | San Joaquin Pipeline No. 3 Cross-Connection & Valves | McGuire & Hester | 8-3-64 | --- | 322,060 | 311,579 |
| HH-364 | San Joaquin Pipeline No. 3 Section C | Healy Tibbitts Construction Company | 10-21-63 | 12-9-64 | 1,516,835 | 512,629 |
| HH-365 | Replacement of Radio System | General Electric Co. | 7-22-63 | 9-9-64 | 39,269 | 4,849 |
| HH-368 | Modification to Eleanor Tunnel Intake | Thomas Construction Company | 11-23-64 | 12-1-64 | 32,575 | 35,822 |
| HH-369 | Repair of Turbine Wheel Cherry Powerhouse | Hetch Hetchy Water Supply | 4-19-63 | 8-15-64 | 4,875 | 4,650 |

(Cont'd)

TABLE 16 - (Cont'd)
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1964-65

| Contract No. | Description | Contractor | Contract Time Started | Contract Time Completed | Original Contract Price | Value of Work Done During Fiscal Year |
|--------------|---|-------------------------------------|-----------------------|-------------------------|-------------------------|---------------------------------------|
| HH-370 | Service Platform Cherry Powerhouse | California Blowpipe & Steel Company | 6-8-64 | 7-21-64 | \$ 2,490 | \$ 1,490 |
| HH-371 | Paint Steel Transmission Line Towers | Gores Tank and Steeplejack Company | 6-1-64 | 9-15-64 | 15,900 | 12,462 |
| HH-372 | Replace Water Lines at Moccasin | Hetch Hetchy Water Supply | 8-3-64 | 11-13-64 | 3,720 | 3,330 |
| HH-373 | Construct Fences - Moccasin & Alameda Creek | United States Steel Corporation | 12-14-64 | 1-29-65 | 2,690 | 2,690 |
| HH-376 | Canyon Powerhouse | Peter Kiewit Sons' Co. | 11-2-64 | --- | 4,293,439 | 623,121 |
| HH-377 | Canyon Penstock | J. H. Pomeroy & Co. | 6-28-65 | --- | 2,322,000 | 8,240 |
| HH-378 | Bridge Crane for Canyon Powerhouse | Broadline Co. | 11-23-64 | --- | 80,350 | 49,219 |

(Cont'd)

TABLE 16 - (Cont'd)
HETCH HETCHY WATER SUPPLY & POWER SYSTEM

CONSTRUCTION CONTRACTS
FISCAL YEAR 1964-65

| <u>Purchase Order No.</u> | <u>Description</u> | <u>Contractor</u> | <u>Contract Time Started</u> | <u>Contract Time Completed</u> | <u>Original Contract Price</u> | <u>Value of Work Done During Fiscal Year</u> |
|---------------------------|---|-----------------------------------|------------------------------|--------------------------------|--------------------------------|--|
| 48374 | Turbines, Governors, Valves, etc., Canyon Powerhouse | Mitachi-New York, Ltd. | 8-8-63 | --- | \$1,038,679 | \$ 441,879 |
| 64580 | Relief Valve for San Joaquin Pipeline No. 3 | Darling Valve & Manufacturing Co. | 3-30-64 | --- | 42,494 | 31,871 |
| 88519 | Power Transformers for Canyon Powerhouse | Allis-Chalmers Manufacturing Co. | 12-8-64 | --- | 368,041 | --- |
| 97584 | Turbines, Governors, Valves, etc., Occasin Powerhouse | Mitachi-New York, Ltd. | 3-11-65 | --- | 1,211,402 | --- |
| 99783 | Oil Circuit Breakers for Intake Switchyard | Westinghouse Electric Corporation | 4-21-65 | --- | 125,300 | --- |

Total Amount of Hetch Hetchy Contract Construction Work Performed During Fiscal Year

\$3,948,380

TABLE 17
SAN FRANCISCO INTERNATIONAL AIRPORT

| CONSTRUCTION CONTRACTS
FISCAL YEAR 1964-65 | | | | | |
|---|--|--|---|-------------------------------|---|
| Contract
No. | Description | Contractor | Contract Time
Started Completed | Original
Contract
Price | Value of Work
Done During
Fiscal Year |
| A-331 | Parking Garage | Engstrom-Nourse &
Massman Constr. Co. | 7-8-63 --- | \$7,459,000 | \$3,333,047 |
| A-333 | Runway & Apron Pavement | Lowrie Paving Co. | 4-6-64 12-11-64 | 731,635 | 506,709 |
| A-345 | Flight Announcing System
Central Terminal | Communications Systems | 5-24-65 --- | 3,150 | 500 |
| A-354 | Alterations to Central
Terminal Building | Arntz Construction Co. | 8-31-64 --- | 1,203,000 | 895,627 |
| A-359 | Modification to Field
Power Station "C" | Metropolitan Electric
Company | 9-14-64 4-20-65 | 7,311 | 7,311 |
| A-365 | Additions to South Terminal | Les Kelly | 8-3-64 5-20-65 | 112,555 | 120,850 |
| A-366 | Air Cargo Building No. 4 | Col Wel Constr. Co. | 2-1-65 --- | 277,927 | 166,399 |
| A-367 | Air Cargo Building No. 4
Paving | Lowrie Paving Co. | 10-26-64 --- | 187,194 | 177,646 |
| A-372 | Concrete Paving for Pier "E" | Lowrie Paving Co. | 7-6-64 10-23-64 | 64,083 | 69,190 |
| A-373 | Blast Fence for Aprons | Gerrell Enterprises, Inc. | 5-3-65 --- | 29,676 | 28,000 |
| A-375 | Paving - Parking Lot "B" | F. F. & M. Company | 8-10-64 10-8-64 | 69,285 | 70,291 |
| A-376 | Repaving Parking Lot 2 | L. C. Smith Co. | 10-19-64 6-4-65 | 65,743 | 67,016 |

(Cont'd)

TABLE 17 - (Cont'd)
SAN FRANCISCO INTERNATIONAL AIRPORT

| Contract No. | Description | CONSTRUCTION CONTRACTS
FISCAL YEAR 1964-65 | | Original Contract Price | Value of Work Done During Fiscal Year |
|--------------|--|---|---------------------------------|-------------------------|---------------------------------------|
| | | Contractor | Contract Time Started Completed | | |
| A-377 | Improvement to Water and Sewage Systems | R. B. McHair Sons | 4-5-65 --- | \$ 55,684 | \$ 17,598 |
| A-379 | Pavement Overlay - Runway 1R | Lovrie Paving Co. | 7-6-64 7-21-64 | 8,815 | 8,815 |
| A-385 | Baggage Dispenser Central Terminal Building | Mathews Conveyor Co. | 8-24-64 5-13-65 | 20,944 | 21,489 |
| A-386 | Outbound Baggage Conveyors South Side Central Terminal | Mathews Conveyor Co. | 5-24-65 --- | 72,066 | 3,600 |
| A-388 | Power Stations M, P & Q and Cable 12A-6 | Consolidated Comstock | 9-28-64 6-3-65 | 43,070 | 43,070 |
| A-391 | Replacement of Damaged Pipes at Pier "G" | Harry Lee, Inc. | 3-1-65 3-10-65 | 2,222 | 2,222 |
| A-392 | Silt Removal | McGuire & Hester | 11-2-64 12-9-64 | 4,195 | 4,472 |
| A-393 | Moving Lamps - Parking Garage | Stephens-Adamson Mfg. | 1-25-65 --- | 356,470 | 185,364 |
| A-398 | 12-kv Electric Service | Brayer Electric Co. | 5-17-65 --- | 76,883 | 15,376 |
| A-399 | Oxidation Pond and Pumping Facilities | Baldwin Warren Co. | 6-7-65 --- | 58,416 | 21,985 |
| A-403 | Additions to Boiler Room South Terminal | Walter S. Leland Co. | 3-15-65 5-28-65 | 4,130 | 4,130 |

(Cont'd)

TABLE 17 - (Cont'd)
SAN FRANCISCO INTERNATIONAL AIRPORT

| <u>Contract No.</u> | <u>Description</u> | <u>CONSTRUCTION CONTRACTS</u>
<u>FISCAL YEAR 1964-65</u> | | <u>Original Contract Price</u> | <u>Value of Work Done During Fiscal Year</u> |
|--|--|---|--|--------------------------------|--|
| | | <u>Contractor</u> | <u>Contract Time Started Completed</u> | | |
| A-405 | Alterations to Heating System Phase I - Former Pan. Am. Base | Barnett Plumbing and Heating, Inc. | 5-3-65 --- | \$ 71,245 | \$ 64,120 |
| A-406 | Moving Walks - Parking Garage | Westinghouse Electric Corporation | 4-12-65 --- | 227,181 | 5,000 |
| A-407 | 225-kva Transformer for Coast Guard | Sergeson Electric | 4-5-65 5-26-65 | 1,133 | 1,133 |
| A-409 | Signs - Central Terminal Building Unit No. 1 | Nelson Neon, Inc. | 5-17-65 --- | 7,764 | 7,000 |
| A-411 | Pavement Repairs Under North Ramp Central Terminal | The Fay Improvement Co. | 5-17-65 5-19-65 | 1,760 | 1,472 |
| A-414 | Condensate Pump - South Terminal Boiler Room | Currie Heating & Plumbing Co. | 6-7-65 --- | 1,977 | 1,500 |
| <u>Total Amount of Airport Contract Construction Work Performed During Fiscal Year</u> | | | | | <u>\$5,850,932</u> |

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* A P P E N D I X *
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HETCH HETCHY WATER SUPPLY, POWER AND UTILITIES ENGINEERING BUREAU
AND
BUREAU OF LIGHT, HEAT AND POWER

ORGANIZATION AND PERSONNEL

O. L. Moore

General Manager

Hetch Hetchy Project

Administration:

B. W. Grethel

Assistant General Manager

Power Production:

R. E. Collins

Senior Electrical Engineer

Water Production:

D. H. Matlock

Senior Mechanical Engineer

Land and Water Resources:

R. Bei

Senior Civil Engineer

Operations:

J. M. Woods

Superintendent of Operations

Accounting:

W. J. Dwyer

Chief Accountant

Utilities Engineering Bureau

Administration:

W. F. Getts

Principal Civil Engineer

Planning:

J. L. Bardoff

Senior Civil Engineer

Civil and Structural Engineering:

R. G. Lee

Senior Civil Engineer

Electrical Engineering (Hetch Hetchy):

S. Yakahi

Electrical Engineer

Electrical Engineering (Airport & Mun. Rwy.):

R. A. Protti

Electrical Engineer

Mechanical Engineering:

B. D. Kong

Associate Mechanical Engineer

Architectural:

S. F. Davis

Senior Architect

Construction:

P. J. Phillips

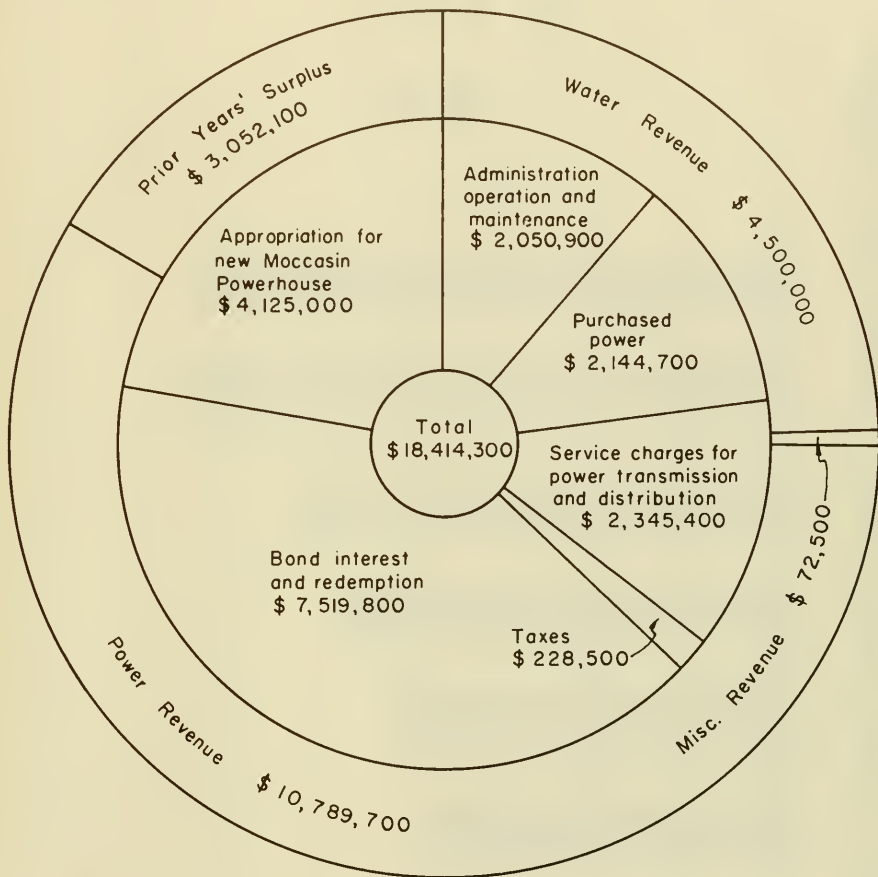
Senior Construction Engineer

Bureau of Light, Heat and Power

Street Lighting and Utility Services:

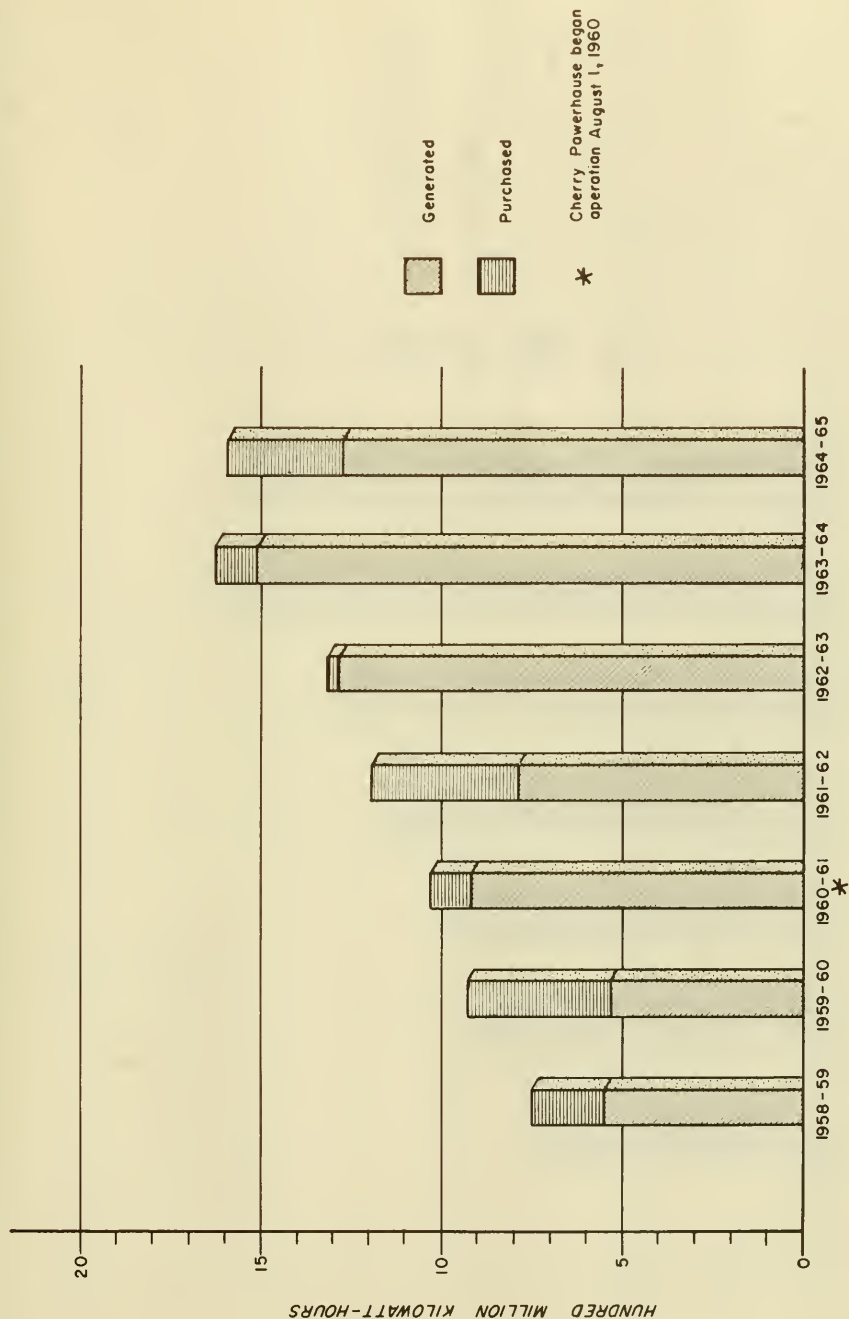
L. R. Clark

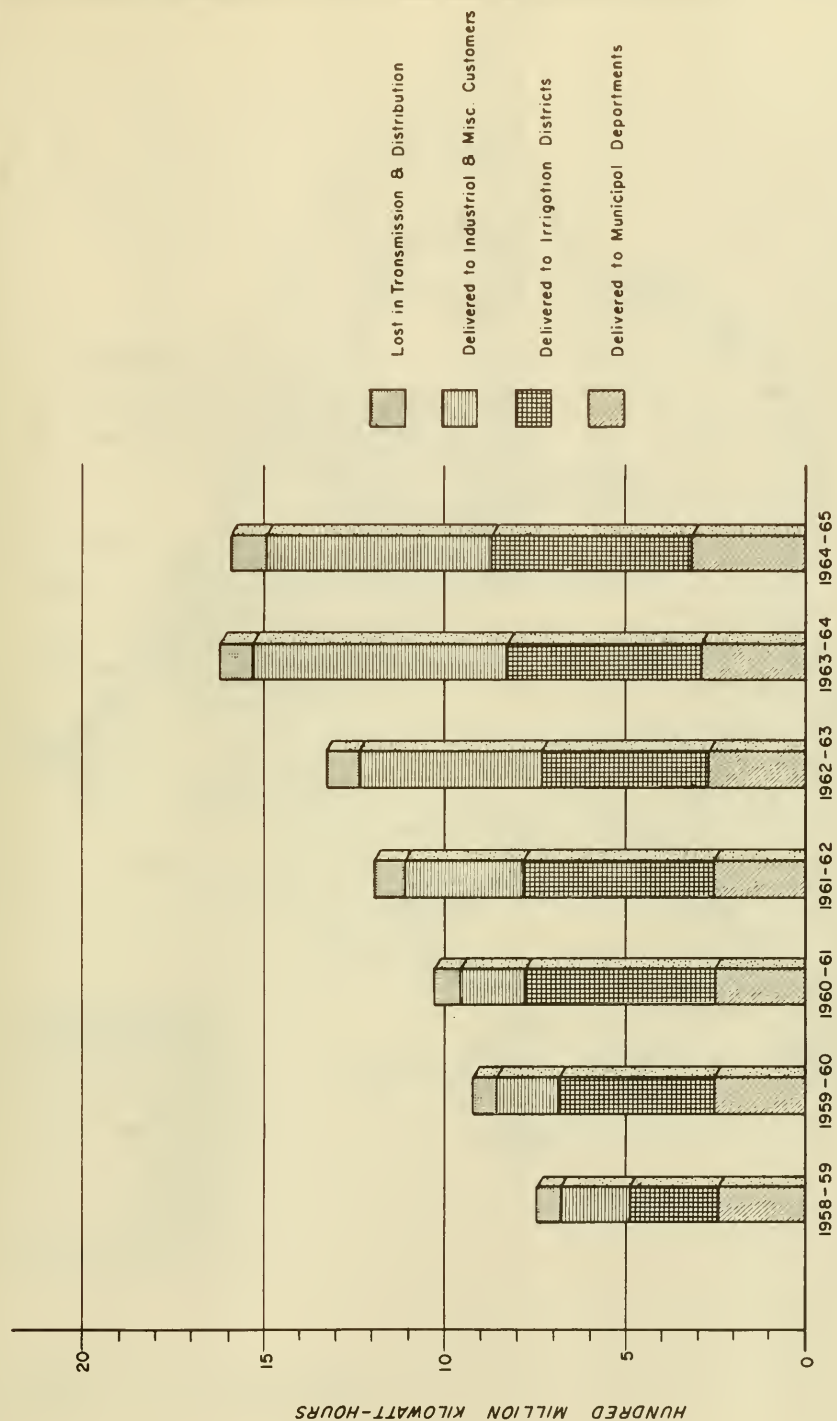
Electrical Engineer



HETCH HETCHY REVENUES AND EXPENDITURES
FISCAL YEAR 1964-65

HETCH HETCHY ELECTRIC ENERGY — GENERATED AND PURCHASED





DISTRIBUTION OF HETCH HETCHY ELECTRIC ENERGY



